



# Research for Mitigating Syndromes of Global Change

**A Transdisciplinary Appraisal  
of Selected Regions of the World  
to Prepare Development-Oriented  
Research Partnerships**

Edited by  
Hans Hurni, Urs Wiesmann  
and Roland Schertenleib

*perspectives*  
Volume 1

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The SPSP was a bridge that helped prepare research partnerships within  
the framework of the NCCR North-South. Suspension bridge over the  
Shakhdara river in the Tajik Pamirs. Photo: Daniel Maselli

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## Preface

Joint definition of research objectives is one of the main principles of international research partnerships. This normally also implies involving representatives of stakeholders outside the scientific community. In 1999, while preparing a proposal for a Swiss National Centre of Competence in Research (NCCR) dealing with the problems and potentials of developing and transition countries, it was unfortunately not possible to fully ensure these conditions. Only involvement from a distance was possible on the part of proposed partners in the South, owing to a lack of the time and funding required for their participation in the numerous meetings and working sessions that took place in Switzerland over the course of more than one year, between February 1999 and March 2000. The proposed Swiss partners all felt strongly that this was a drawback in the process of programme design. Moreover, these circumstances contradicted principles advocated since 1998 by the Swiss Commission for Research Partnerships with Developing Countries (KFPE), with which the Swiss partners were associated. What could be done to remedy this situation?

In early 2001, increasingly positive signals from the Swiss Federal Council indicated its support for funding of the proposed long-term NCCR North-South research partnership programme, provided it was approved by the Swiss Parliament. With this in mind, the Swiss Association for Research Partnership Institutions (SARPI), the initiator of the NCCR North-South, approached the Swiss National Science Foundation (SNSF) and the Swiss Agency for Development and Cooperation (SDC), asking them to co-finance an interim preparatory project that would allow the research partnerships to be initiated smoothly, pending formal approval of the NCCR North-South programme. Thanks to the SNSF Swiss Priority Programme Environment (SPPE), which agreed to thoroughly review the proposal and responded positively, and to SDC's willingness to finance a major portion of the project, the Syndrome Pre-Synthesis Project (SPSP) was launched in April 2001.

Nine international workshops were held from April to August 2001, as part of the SPSP implementation process. One took place in Switzerland, to prepare for eight upcoming regional workshops. Most important, however, were the eight workshops held in all the regions foreseen as "Joint Areas of Case Studies" (JACS) in the NCCR North-South programme proposal. Most SARPI members showed considerable enthusiasm when exercising their



responsibilities within the SPSP, although some remained sceptical about the outcome of parliamentary negotiations and the decisions expected in the June session of the Swiss Parliament.

When both chambers of Parliament approved funding for the NCCR North-South in June 2001, three of the eight regional workshops had already taken place; three more were scheduled for July, and two for August. The remaining workshops were held with a great sense of relief and dedication. Three quarters of the participants in each workshop were from the proposed JACS regions, and only one quarter from Switzerland. Thus it was finally possible to redress the earlier imbalance in preparing the proposal by clearly involving all partners in joint design of a research programme. The primary aim of the present publication is to present the results of these workshops, give an overall picture of the SPSP, and introduce the NCCR North-South.

The editors, authors and heads of NCCR North-South projects would like to acknowledge the special efforts made by the many contributors to the SPSP and to this publication. First and foremost, this project would not have been possible without the keen and dedicated support of Dr. Daniel Maselli, then working at SDC and serving as a delegated representative to KFPE. Without his persistent encouragement, it is unlikely that we would have summoned the energy to initiate this project. Our thanks go in equal measure to Dr. Urs Christ, who played a similar role within the SNSF. All organisers and participants at the workshops, in Switzerland and in all JACS regions worldwide, were deeply engaged throughout the process; their names are listed in Annex 1 of this publication. Last but not least, the editors would also like to thank Prof. Christoph Schäublin, rector of the University of Berne, Prof. Urs Würigler, vice rector of the University, and Prof. Heinz Veit, director of the Institute of Geography, for providing a home for the NCCR North-South.

Berne, 1 September 2003

The editors:  
Hans Hurni, Urs Wiesmann,  
Roland Schertenleib

**Part I**  
**Background and**  
**Framework**



# 1 Initiating Research for Mitigating Syndromes of Global Change in Different Contexts

Hans Hurni, Urs Wiesmann, Pascale Anton and Peter Messerli

## Abstract

Syndromes of global change can be observed in many regions of the world. Mitigating such syndromes is a vital task for the international community and a precondition for sustainable development. Research institutions in particular need to confront the challenge of contributing to mitigation efforts. International research partnerships are one vehicle that can be employed for mutual strengthening of capacity and competence in syndrome mitigation research. In 1999 the Swiss government invited Swiss research institutions to propose a series of National Centres of Competence in Research (NCCRs) in order to strengthen Switzerland's position in the international research arena. One of the 14 finalists chosen in a competitive selection process was the "NCCR North-South". This long-term programme deals with international partnerships for development-oriented research. A preparatory project, the "Syndrome Pre-Synthesis Project" (SPSP), was initiated in 2001, and applied a transdisciplinary approach to identify development-oriented research partnerships in eight regions of the world. The present publication is the outcome of the SPSP. It addresses core problems and corresponding research needs in three major "syndrome contexts": "urban and peri-urban", "semi-arid" and "highland-lowland". Chapter 1 gives a concise introduction to the goals, the main concepts and the conceptual framework of the NCCR North-South programme and the SPSP project.

## 1.1 Goals, objectives and background of the publication

This book provides an overview of knowledge about the negative impacts of global and local change in selected regions of the world, based on qualitative appraisals made by multidisciplinary teams of specialists. It also outlines how research can contribute to mitigating these impacts and reinforcing positive trends in order to promote sustainable development. In particular, the book

- describes how partners from different countries and backgrounds jointly designed a research partnership programme, using a transdisciplinary approach;
- identifies and provides an overview of core problems of non-sustainable development associated with “global change” in different regions of the world;
- clusters these core problems into so-called “syndromes” and discusses the corresponding “syndrome contexts” observed in each region;
- outlines research projects that aim to mitigate these “syndromes of global change”, and
- provides a synopsis of “syndrome contexts” and core problems that will form the basis for an evaluation of the outcomes of the long-term NCCR North-South research partnership programme.

The NCCR North-South is an international research programme of the Swiss National Science Foundation (SNSF) co-funded by the SNSF, the Swiss Agency for Development and Cooperation (SDC), the Swiss institutions engaged in international research partnerships (Swiss Association of Research Partnership Institutions, SARPI) that launched the programme, and their international partners. The members of SARPI have longstanding experience in development-oriented research. The acronym “NCCR” stands for Swiss “National Centre of Competence in Research”, of which 14 were established in 2001, with potential funding for 10 to 12 years (see Box, p. 22). The aim of the NCCR “North-South” is to engage in “Research partnerships for mitigating syndromes of global change” (NCCR North-South, 2000; see Box, p. 23).

To prepare for the NCCR North-South, a further, short-term project was initiated in early 2001, the “Syndrome Pre-Synthesis Project” (SPSP, see Box, p. 26). The objectives of the SPSP were to jointly develop a conceptual and

methodological framework in preparation for the NCCR North-South, by providing the means to formulate a pre-synthesis for syndrome mitigation research through international cooperative partnerships in each region of future involvement of the NCCR North-South. The SPSP lasted from 1 March 2001 until 30 June 2002. The approach was a participatory one, involving representatives of local research institutions in the chosen regions. The project resulted in a series of pre-syntheses for assumed “syndrome contexts” in the eight regions chosen worldwide.

### NCCR North-South glossary

**Global change:** Global-scale human, human-induced and natural changes that modify the functionality of the natural, social, economic and cultural dimensions of the Earth system.

**Globalisation:** Increasing interlinking of political, economic, institutional, social, cultural, technical and ecological issues at the global level.

**Governance:** A general conceptual framework for addressing the evolution and organising principles of governing processes in a society. It refers to the ways decisions are taken and implemented, and takes into account formal as well as informal arrangements and actors.

**Marginal region/people:** Region (or people) partially or completely isolated from the mainstream of development.

**Mitigation research:** Research that contributes to problem-solving by producing knowledge for decision support and by developing tools to enable stakeholders to initiate mitigation measures and processes and work towards sustainable development.

**Region:** A spatial area defined by one or more specific (e.g. political, institutional, economic, social, cultural, infrastructural, bio-physical, ecological, etc.) characteristics. Depending on how it is defined (e.g. “administrative region”, “language region”, “arid region”, “Central Asian region”), a region may cover several small (e.g. district) or large (e.g. country) administrative units.

**Research approach:** A set of research methodologies linked in a common structure chosen or defined by a research community, and guided by declared principles.

(continued p. 14)

### NCCR North-South glossary (continued)

**Research methodology:** A logical set of research methods needed to implement a chosen research approach in view of achieving a pre-defined research goal.

**Research partnership:** Inter-institutional or interpersonal collaborative alliance in a research programme involving international and multicultural partners, and guided by a set of principles (as defined by KFPE, 1998, see Box, p. 19).

**Sustainable development:** Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (WCED, 1987, so-called “Brundtland Report”).

**Syndrome context:** A region (see above) or circumstances in which one or more syndromes of global change actually occur, or may potentially emerge.

**Syndrome mitigation:** Measures taken by individuals or institutions in one or more areas of intervention, which help reduce the effects of single, or combinations of several core problems, thereby actually or potentially reducing negative impacts of global change, and contributing to sustainable development.

**Syndromes of global change:** Clusters of ecological, social, economic, etc. problems or symptoms that form typical patterns, are based on similar processes and emerge in different regions of the world, thereby actually or potentially resulting in adverse impacts at the global level (WBGU, 1997, as modified by the NCCR North-South).

**Transdisciplinarity:** A new form of learning and problem-solving involving cooperation among different parts of society and academia in order to meet complex social challenges (according to Häberli et al., 2001).

**Transdisciplinary research:** Research that integrates the social and natural sciences in a common approach, and includes non-scientific knowledge systems in a participatory and interactive process to improve societal practices.

## 1.2 Syndromes of global change

The point of departure for this book is the assumption that developing and transition countries (the “South”) are affected by a multitude of environmental, political, economic, socio-cultural and technical development problems and disparities. These problems occur in many different contexts, and their frequency and acuteness have accelerated tremendously in the 20th century. They do not occur independently: they are closely interrelated and appear in specific combinations or clusters, depending on concrete situations. Such clusters of problems can be referred to as “syndromes of global change”, a term borrowed from the German Advisory Council on Global Change (WBGU, 1997). While in Switzerland, parts of Europe, the US and other countries of the “North”, climate change has commonly been perceived as the most important core problem of global change, the assumption here is that syndromes of global change are clusters of more than one core problem, and that a number of such syndromes exist that have not been adequately studied so far.

Among the prominent syndromes addressed by WBGU (1997) are the “Sahel Syndrome”, i.e. the process of desertification due to agricultural over-utilisation of semi-arid lands in a weak economic environment; or the “Favela Syndrome”, which refers to spontaneous and rapid peri-urban expansion without adequate development (WBGU, 1997). Although many syndromes of global change are found in developing and transition countries, they may be caused by processes induced by the industrialised world. Moreover, in these countries, many core problems are further aggravated by prevailing poverty, as well as by economic and institutional weakness. Syndromes of global change affect the majority of the world’s population. Hence, top priority must be given to focusing on developing and transition countries, as these countries have only minimal means of their own to find sustainable solutions through research and implementation of programmes. This requirement was widely confirmed at the World Conference on Science held in Budapest from 26 June to 1 July 1999.

Analysis and appraisal of syndromes, and designing of mitigation strategies, require an integrated scientific approach. Most importantly, in order to ensure the acceptability of solutions, broad participation by stakeholders is necessary – and hence, a transdisciplinary perspective and methodology. The “syndrome concept” (*Syndromkonzept*) developed by Petschel-Held et al. (1995) and WBGU (1997) provides a conceptual framework that allows



topical integration as well as global differentiation. To achieve such differentiation, WBGU (1997) proposed and discussed 16 syndromes of global change, 7 of which were highly relevant for developing and transition countries. Recent studies and discussions of the syndrome concept underline its potential and at the same time illustrate that this potential has not yet been fully exploited (cf. Petschel-Held et al., 2000). There is a need to further refine the approach and methodology, as well as to review the first selection of syndromes and the corresponding symptoms proposed by WBGU (1997) and adapted by all following authors, especially Schellnhuber et al. (1997) and Reusswig (1999).

A major critique of the syndrome concept is that it focuses on negative aspects of development, neglecting the innovations, potentials and opportunities for sustainable development that exist at all levels, in various contexts and involving different stakeholders. A further critique is that the syndrome concept leads to an approach that analyses the causes and consequences of syndromes, but does not assist in finding ways of mitigating problems; hence that this approach is purely analytical compared to more solution-oriented approaches. Within the context of the present publication and the research programmes involved, the syndrome concept is therefore not the only conceptual framework for research; it is one component of the research framework of the NCCR North-South, providing the basis for identification and justification of the research projects to be formulated.

### **1.3 Research approach required for syndrome mitigation**

Understanding of the cumulative global effects of global and local change that are likely to affect societies worldwide requires knowledge of a multitude of factors: there is a need to explore causes and effects, processes and dynamics, as well as existing changes and trends. In addition, it is necessary to reflect in depth on how political, social, economic, bio-physical and other negative impacts of global change can be mitigated, and to involve all social groups in the South as well as the North in this cognitive process. Knowledge gained in this manner is related to concrete development measures. Finally, a third type of knowledge is necessary: potentials and innovations that can lead to sustainable development must be explored and understood. These different types of knowledge must be guided by ethical considerations, a reflection on and integration of normative values, and the active participa-

tion of actors, researchers and stakeholders in local to international research and development programmes that aim for more equity and justice at the intra- and intergenerational, and intra- and interregional levels. Given the complexity of syndromes of global change and of the types of knowledge needed to understand and mitigate them (see Fig. 1), multi-level and multi-stakeholder approaches (see Hurni, 1998) appear to be the most appropriate for research on existing and potential options for mitigating and eventually overcoming such syndromes. Hence they are the key elements of the research programme described here.

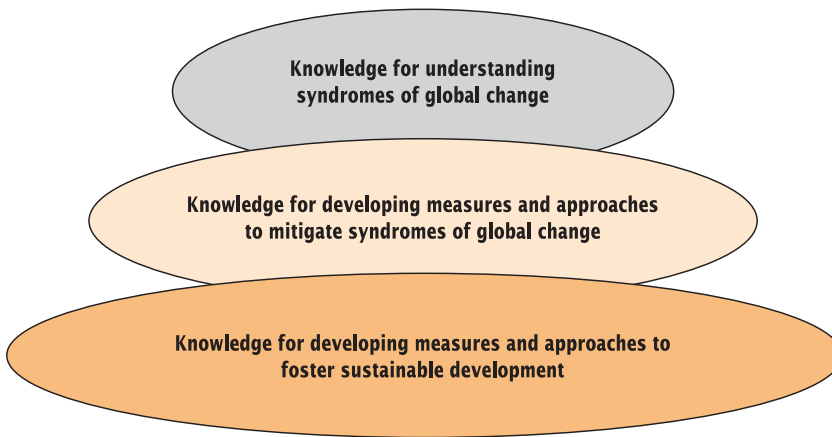


Fig. 1  
Three types of knowledge that need to be generated to enhance understanding of syndromes of global change and make effective contributions to mitigation and sustainable development.

The basic assumption that syndromes of global change consist of problems clustered in characteristic patterns implies that strategies for syndrome mitigation (for a definition, see Box, p. 14) cannot be developed by focusing only on single problems, actor categories, levels of intervention, institutions, or policies. A research approach is needed that addresses the clustering of development problems and their interrelations in an integrated way.

Research on and for mitigating syndromes of global change (“mitigation research”) is a relatively new field of science. It can be defined as “research that contributes to problem-solving by producing knowledge for decision support and by developing tools to enable stakeholders to initiate mitigation measures and processes and work towards sustainable development” (see Box, p. 13). The research programme initiated by the NCCR North-South does not restrict its focus to individual, locally-bound syndromes of global

change, but concentrates on “syndrome contexts” that are globally, regional-ly and locally relevant “hot spots” of non-sustainable development. In each context chosen for study, the definition of syndromes and the selection of symptoms and interactions are reviewed and refined in a participatory process, and mitigation research is carried out through transdisciplinary, interdisciplinary and disciplinary methods.

## 1.4 International research partnerships

There are very great disparities between research capacity in developed countries and capacity in developing and transition countries. According to KFPE (2001), only about 15 percent of all the resources devoted to research throughout the world are currently being invested in developing and transition countries. Of this 15 percent, India, China and the newly industrialised countries of East Asia account for two thirds, which means that the rest of the developing world accounts for only 4–5 percent of global research resources (UNESCO, 1996). If we take the number of researchers per million inhabitants of a region as an indicator, Africa, with only about 70, has by far the smallest number. The Middle East and India have about 130 researchers per one million inhabitants, the rest of Asia around 340, and Latin America about 550. By contrast, Europe has about 1900 researchers per million inhabitants, and North America about 3640. Japan, Australia and New Zealand have the highest ratios, with about 4380 (Waardenburg, 1999). The density among the latter group is thus almost 63 times greater than in Africa. In addition, researchers in the North can count on higher funding, i.e. they have much better salaries, better equipment, enhanced communication tools and hence a greater potential to be productive (Hurni et al., 2001). In terms of overall budgets, research inequities are thus even much more pronounced than indicated by mere statistics on density.

Among the various forms of research cooperation that aim to strengthen research capacity in developing and transition countries, there are some promising approaches, such as demand-driven research for development (Wolffers, 2000) and, in particular, international research partnerships as defined by the Swiss Commission for Research Partnerships with Developing Countries (KFPE) (KFPE, 1998). Such partnerships have attracted increasing attention and are now considered to be among the most egalitarian forms of research cooperation, offering mutual advantages to multiple stakeholders in the South and the North (KFPE, 2001). In order to help

researchers and funding institutions to set up equitable international research partnerships involving partners in the North and the South, KFPE, established in 1994, developed guidelines aiming to improve international cooperation in research (see Box).

### The 11 Principles of Research Partnerships

1. Decide on objectives together
2. Build mutual trust
3. Share information; develop networks
4. Share responsibility
5. Create transparency
6. Monitor and evaluate collaboration
7. Disseminate results
8. Apply results
9. Share profits equitably
10. Increase research capacity
11. Build on achievements

Source:  
KFPE, 1998

## 1.5 The contexts of syndromes of global change

The Swiss institutions engaged in research partnerships that collaborated to jointly pursue long-term syndrome mitigation research have extensive competence but only limited capacity. They therefore decided to focus on only a few, selected syndromes or typical clusters of problems related to global change, and identified their occurrence in the following three major “syndrome contexts” (see Table 1, p. 20):

- urban and peri-urban;
- semi-arid;
- highland-lowland.

In the urban and peri-urban syndrome context, the speed and degree of urbanisation have long been perceived as a key problem in developing countries, e.g. at the Habitat I conference in 1976. Economic, social and infrastructure problems of metropolisation (Fuchs et al., 1994; Bolay, 1995), and

solving or mitigating such problems through urban planning and infrastructure development (UNCHS, 1996), have been the main focus of research and development cooperation. In the 1990s political attention turned to the broader concept of “sustainable urban development” that was, for example, the core of the Habitat II conference in Istanbul in 1996 (UNCHS, 1996). In spearheading this development, research expanded beyond the traditional focus on processes of metropolisation and their reflection in spatial and socio-economic structures, towards development-oriented action research.

Table 1

NCCR North-South syndrome contexts, and assumed acuteness of syndromes in each context in the “Joint Areas of Case Studies” (JACS).	Syndrome context	Urban and peri-urban	Semi-arid	Highland-lowland
	Location of the NCCR North-South “Joint Areas of Case Studies” (JACS)	(acuteness of syndromes in context)	(acuteness of syndromes in context)	(acuteness of syndromes in context)
	West Africa	XXX	XXX	–
	East Africa	XX	XXX	XX
	Horn of Africa	–	XX	XXX
	Central Asia	XX	XX	XXX
	South Asia	XX	XX	XX
	South East Asia	XXX	–	XX
	Central America and the Caribbean	XXX	–	X
	South America	XX	–	XXX
	Alps (Switzerland)	X	–	X

Acuteness of syndromes: X: potentially acute      XX: acute      XXX: highly acute

With respect to the semi-arid context, the drought in the Sahel region of the early 1970s drew public awareness and concern (Denève, 1995; Sinn, 1988), leading to a number of development policies as well as research. The Sahel zone in particular has become a paradigmatic example of environmental degradation due to a combination of climate change and poverty-driven over-utilisation of resources (Hammer, 1999; Giri, 1989). This has given rise to international initiatives to combat desertification (UNCCD, 1997). Research on desertification concentrated for a long time on the question whether climate change and the fragility of natural resources, or increased densities of traditional land uses were the main factors contributing to the problems. New research approaches are focusing on problems, potentials and processes in these zones.

In the highland-lowland context, research has long focused on mountains alone, e.g. on mountain ecology (Ives, 1989; Gerrard, 1990), mountain cultures (Manjari, 1995; Grötzbach and Stadel, 1997), and mountain agriculture and tourism (Jodha et al., 1992; Mountain Agenda, 1999). However, the inclusion of Chapter 13 on sustainable mountain development in UNCED's Agenda 21 in 1992 strengthened a research focus that integrates these various aspects and incorporates interrelations between highlands and lowlands. The starting point for this focus was the observation that most mountain and highland systems in the developing countries of the tropics and sub-tropics are resource-rich zones, contrary to the situation in most developed countries (Myers et al., 2000).

## **1.6 Swiss National Centres of Competence in Research (NCCRs), and the NCCR North-South**

In order to maintain Switzerland's position as a leader in research, the Federal Government and Parliament, at the request of the Swiss National Science Foundation (SNSF), introduced a new mechanism in 1999 to support cutting-edge research in the country. As a result, National Centres of Competence in Research (NCCRs) were established and given a maximum funding perspective of 12 years. The SNSF will evaluate each of the 14 NCCRs created so far after four and eight years, and decide whether their activities can be encouraged for another four years after assessing their research results.

NCCR programmes place special emphasis on interdisciplinary approaches and on innovative initiatives within the disciplines. In addition, they stimulate concentration of resources, distribute tasks more effectively among Swiss research institutions, and promote partnerships between academia and the outside world. The NCCRs have also committed themselves to knowledge and technology transfer and support of young researchers. A key idea is to employ a bottom-up approach in which researchers not only propose the themes but also create the structures to carry out their research and exploit the results. A total of CHF 529 million has been allocated to the 14 NCCRs for the first four-year period.

The NCCR North-South programme has introduced a set of research methods that fulfil the criteria of "sustainability-oriented development research". The orientation and selection of research components have been based on an

### National Centres of Competence in Research (NCCRs)

The Swiss Federal Council's 1998 research policy (Federal Council, 1998) stipulates that a new series of "National Centres of Competence in Research" (NCCRs) should be created in four main fields: the life sciences, the social sciences, sustainable development and environment, and information and communication technologies.

These NCCRs promote long-term research projects in areas of vital strategic importance for the evolution of science in Switzerland, the country's economy and Swiss society (see the SNSF web site). Each National Centre of Competence is based in and managed from a university or other renowned research institution. A network links the research groups from this home institution with other teams throughout Switzerland. The following aspects are decisive for the approval of a National Centre of Competence: it must conduct research of outstanding, internationally recognised quality, and actively foster knowledge and technology transfer, training and the advancement of women researchers. A further aim of the NCCRs is to generally restructure and improve the organisation of Swiss research. Federal funding for the NCCRs is approved by Parliament, and supplemented by funding from the institutions themselves and from third parties. Launched in 2001, the programme is expected to include up to 25 NCCRs in its final stage.

Source:

SNSF web site

initial qualitative appraisal of selected syndrome contexts in the regions where they are being implemented. As research dealing with syndrome contexts cannot be carried out using conventional methods alone, innovative and integrated approaches and new methods of collaboration are being developed. Moreover, given the thematic focus of the programme, research results are urgently needed for enhancement of external measures such as emergency aid, reconstruction and development cooperation, and support for problem-solving efforts by people, public officials and the economic sector at the local level.

The NCCR North-South programme is seeking to address some of the complex problems of syndromes of global change through specifically focused research, in partnership with researchers in developing countries and countries in transition. Three long-term objectives have been defined to achieve this aim (NCCR North-South, 2000):

- To promote disciplinary, interdisciplinary and transdisciplinary research focusing on sustainable development (“transdisciplinary” in this context is understood as an approach based on collaboration with local people that takes account of their rich knowledge);
- To help develop institutions and train staff in these fields of research, in partner countries and in Switzerland; and
- To support societies and institutions in partner countries in their autonomous efforts to address syndromes of global change over the long term.

### **The Swiss NCCR North-South**

The present-day world is threatened by increasing insecurity caused by globalisation, global disparities and processes of global change. In some regions, core problems occur in characteristic clusters that can be perceived as syndromes of global change. The mitigation of these syndromes is a challenge; it is also a precondition for achieving sustainable development.

The National Centre of Competence in Research (NCCR) North-South addresses this challenge. It focuses on international research cooperation and promotes disciplinary, interdisciplinary and transdisciplinary research that aims to enhance understanding of the status of different syndromes of global change, the pressures these syndromes and their causes exert on different resources (human, natural, economic), and the responses of different social groups and society as a whole. By identifying the potential of social systems to mitigate syndromes, considering their dynamics and adopting existing innovative solutions, the NCCR North-South primarily aims to help design ways to mitigate syndromes. The NCCR North-South enables Swiss research institutions to enhance partnerships with institutions in developing and transition countries, thereby building the competence and capacity of research on both sides to develop socially robust knowledge for mitigation action.

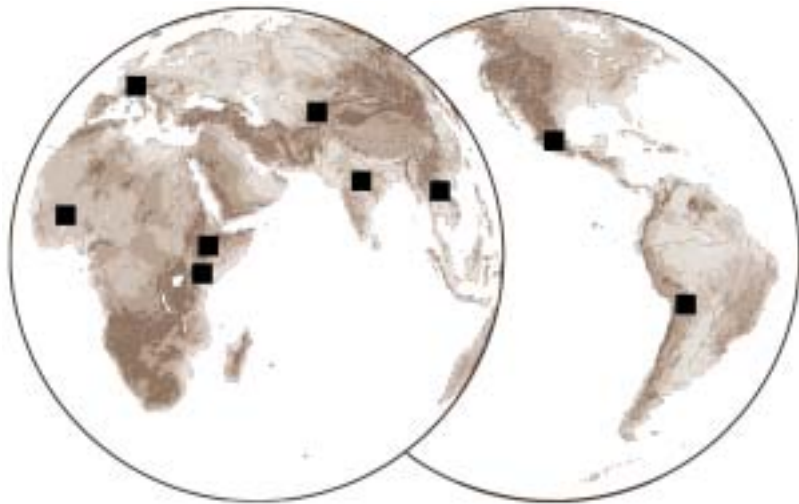
Through its activities and partnerships, the NCCR North-South also helps develop the capabilities of partner institutions and societies at large in developing and transition countries, thus eventually assisting these institutions in finding sustainable solutions with the means available in their own local contexts.

Source:  
NCCR North-South  
web site



NCCR funding options and experience available among Swiss partners made it possible to develop research partnerships in eight regions of the world and in Switzerland, as shown in Figure 2. The syndrome contexts studied in each region are listed in Table 1 (p. 20). Within Switzerland, the NCCR North-South is part of a closely-knit network of institutions, including the Swiss Tropical Institute (STI) in Basel, the Institute for Development Studies (IUED) at the University of Geneva, the Swiss Federal Institute of Technology in Zurich (ETHZ), the Swiss Federal Institute of Technology in Lausanne (EPFL), the Universities of Berne and Zurich, and the Swiss Peace Foundation (swisspeace). This network thus represents a very wide range of disciplines, a necessary condition when assembling the best available expertise in scientific teams that need to collaborate with local partners in the nine selected regions of the world. The Swiss network is organised as an association supported by the Swiss Commission for Research Partnerships with Developing Countries (KFPE), an organ of the Council of the Swiss Scientific Academies (CASS). This structure is an interesting example of a new type of cooperation among universities and could herald the type of “Swiss University” that is currently being discussed in research policy.

Fig. 2  
The different  
regions, or Joint  
Areas of Case  
Studies (JACS), in  
which the NCCR  
North-South is car-  
rying out research  
partnerships.  
Source: NCCR  
North-South, 2000



Collaboration with the Swiss Agency for Development and Cooperation (SDC) is a further essential condition for implementation of the NCCR North-South programme. SDC is funding active participation by partner institutions in developing and transition countries, as well as training and education in these countries. Research that should be characterised as a joint effort undertaken by equal partners can only be carried out in this way. SDC funding, which is at a level similar to that provided by the SNSF, allows a large number of researchers in partner countries to be integrated into the programme and trained in common approaches and methods of research for mitigating syndromes of global change.

## **1.7 The Syndrome Pre-Synthesis Project (SPSP)**

In order to develop a conceptual and methodological framework in preparation for the NCCR North-South, a further application for project funding was submitted to SNSF and SDC in March 2001. The aim of the project was to provide the means for formulating a pre-synthesis for syndrome mitigation research by means of international cooperative partnerships in each region of future involvement of the NCCR North-South. SNSF and SDC approved the Syndrome Pre-Synthesis Project (SPSP), which lasted from 1 April 2001 until 30 June 2002, and attempted to produce a series of pre-syntheses for assumed syndrome contexts in different regions of the world. The project applied a participatory approach characterised by partnership work involving representatives of local research and development institutions in these regions. The unusual term “pre-synthesis” was chosen to indicate that this first, qualitative appraisal and synthesis was made prior to the launching of the long-term research partnerships of the NCCR North-South programme.

Conceptually, the SPSP made use of the approach of the NCCR North-South programme, with the idea of using the intermediate period productively until the latter programme was approved and launched. Despite these close linkages, the SPSP had its own outputs, objectives and a specific goal, i.e. to initiate a process of participatory learning involving researchers in partner countries and Switzerland. This process focused on the definition and joint identification of syndromes of global change, on a discussion of research methodologies and on pre-syntheses of syndrome contexts in each JACS, thereby preparing long-term mitigation research in relation to the major syndromes in the urban and peri-urban, semi-arid and highland-lowland contexts.

In an initial SPSP workshop, participants from the North developed the conceptual and methodological framework for preparing pre-syntheses of each region and of the syndrome contexts identified in each region. This event, which took place in Switzerland in early April 2001 (see Chapter 3 in this publication), was followed by a series of regional workshops held between May and September 2001 in the regions chosen for future collaboration, i.e. in Africa (3 workshops), Asia (3 workshops) and Latin America (2 work-

### **SPSP: Syndrome Pre-Synthesis Project**

The goal of the SPSP was to initiate a process of participatory learning involving researchers in partner countries and Switzerland. This process focused on the syndrome approach, research methodologies and pre-syntheses of syndrome contexts in each JACS, thereby preparing long-term mitigation research relating to major syndromes in the urban and peri-urban, semi-arid and highland-lowland contexts.

The objectives were to:

- develop a conceptual and methodological framework for a participatory assessment of core problems and their clustering in syndrome contexts, particularly in the three syndrome contexts to be addressed by the NCCR North-South programme;
- carry out eight regional pre-syntheses of syndromes as a basis for, and in preparation of, long-term research partnerships;
- identify key hypotheses and research questions to be elaborated in research partnership projects;
- prepare a synopsis of all regional syntheses of the observed syndrome contexts and publish it in this report;
- train representatives of partner institutions in developing and transition countries in methodology and pre-synthesis work relating to syndrome mitigation research.

The project was submitted to and approved by the Swiss National Science Foundation (SNSF). It was jointly funded by the Swiss Agency for Development and Cooperation (SDC), the SNSF and the implementing institutions. It was implemented between 1 April 2001 and 30 June 2002.

Source: SPSP, 2001

shops). These events were used to carry out the most important part of the synthesis work, to formulate research questions for future mitigation research and to train partners. The results of these workshops were then enhanced by important additional background information that was woven into the draft pre-syntheses for the syndrome contexts in each JACS (Chapters 4 to 12). All reports were then synoptically interpreted in a final Part (Chapters 13 and 14). The present report consists of the products of the project, including both the methodological framework and the pre-synthesis reports.

The main merit of the SPSP was that it enabled partners in Switzerland and in the South to capitalise on experience gained by them in projects that had been carried out with the support of the SNSF (e.g. the Swiss Priority Programme Environment [SPPE], Module 7 on environment and development), as well as other programmes implemented by the partners over the past decades. The project also built a bridge between the phased-out SPPE Module 7 projects and the NCCR North-South programme.

The project produced tangible results in terms of conceptual design, methodology and institutional training in partnership for designing syndrome mitigation research. It also resulted in a first “pre-”synthesis of syndrome contexts in areas where future projects have since been established. In terms of social achievements, the project facilitated local participation by stakeholders to prepare a set of partnership projects for syndrome mitigation research, and it enabled the training of local participants in coordinating research partnership activities for syndrome synthesis and design of mitigation research. Finally, it helped close the gaps created between the long-term planning process for the NCCR North-South and the conclusion of other collaborative research projects.

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## 2 Towards Transdisciplinarity in Sustainability-Oriented Research for Development\*

Hans Hurni and Urs Wiesmann

### Abstract

Transdisciplinarity has become an important aspect of research partnerships that aim to mitigate syndromes of global change. This research approach is necessary to identify and reflect on sustainability-oriented research for development, and to facilitate various stages of implementation of this form of research. The past 25 years of development cooperation have seen an evolution from disciplinary to participatory and transdisciplinary methodologies. More recently, the significance of transdisciplinarity has been acknowledged as a new form of learning and problem-solving involving cooperation among different partners in society and academia, in order to meet complex challenges of society. Transdisciplinarity has now been incorporated in many sustainability-oriented research frameworks. By taking the qualitative appraisal of syndrome contexts as a transdisciplinary starting point for sustainability-oriented research for development, the NCCR North-South has combined two conceptual frameworks – the syndrome concept and the transdisciplinary approach – in its overall definition of syndrome mitigation research. This concrete application of transdisciplinarity, combined with more conventional, disciplinary to interdisciplinary approaches in a chronological sequence, has received international recognition as an innovative and promising approach, and has aroused a great deal of interest.

\* This chapter is a modified version of a paper originally published in German (Hurni and Wiesmann, 2001).



## 2.1 From participatory to transdisciplinary research

In their search for solutions to concrete development problems, professional development organisations have, as a rule, been using participatory methods for more than two decades, as this approach has proved very effective. This means that local populations and decision-makers are involved in planning and implementing projects. Participatory approaches were also taken up at a correspondingly early stage in so-called action research, although with considerably greater hesitation than in development cooperation. These largely empirical approaches were given a theoretical basis only with the establishment of transdisciplinarity as a concept and approach. In essence, a transdisciplinary approach requires that phenomena under investigation be regarded from a perspective that (a) goes beyond specific disciplines and (b) is based on broad participation, characterised by systematic cooperation with those concerned.

Thus two issues need to be addressed in transdisciplinary research. First, do participatory research approaches adequately meet the requirements of transdisciplinarity, or do they need to be further elaborated? Of course this means identifying the limits of transdisciplinarity, and also defining how and where there is an additional need for interdisciplinary and disciplinary methods. Second, the past few years have shown that transdisciplinary research is not only a meaningful addition to individually pursued research in the context of development cooperation, but that it also expands the potential of traditional methods in all other areas of research.

In order to pursue the evolution of approaches from disciplinarity to transdisciplinarity, let us consider a concrete example from development cooperation (Fig. 1). In the highlands of Madagascar, there are many large gullies caused by erosion, known locally as *lavakas*. Intense rainfall during the monsoon causes heavy runoff in hill zones that have been deforested for centuries, especially when cyclones come from the east, ripping open gullies that can reach a depth of 100 m in the weathered tropical bedrock. The logical response of foresters specialising in development has been to argue for afforestation of catchments surrounding such gullies, as shown in Figure 1. However, a more precise analysis of the impact of rainfall and erosive processes conducted by geomorphologists showed that gullies advance towards the rear, encroaching upon afforested areas, and that the sheer size of the gullies qualifies them as catchments in their own right; these produce new runoff, leading to more erosion. In other words, afforestation cannot



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halt erosion. The original analysis was thus clearly enhanced by interdisciplinary collaboration between foresters and geomorphologists.

This perspective was further expanded by applying a participatory research approach: the local population, who has to live with the *lavakas*, was asked to help assess the problem. This process revealed that in most cases, farmers actually welcomed sandy sediment flows from the gullies as a highly beneficial source of mineral fertiliser for rice terraces downslope, whose yields constitute an important source of income. Hence, the search for solutions took quite a different shape when the research approach employed a transdisciplinary method from the outset.

While initial approaches were sectoral, i.e. disciplinary in nature and hence to some degree tailored to suit the curiosity of researchers, the need for a broader scientific approach rapidly became apparent in the concrete development context. In addition to natural science and technology aspects, economic and ultimately social dimensions were explored, raising the question

Fig. 1  
Example of  
huge *lavaka*  
erosion gul-  
lies in Mada-  
gascar, with  
afforested  
area above  
the gullies  
intended to  
protect the  
irrigated rice  
fields below  
them.

Photo:  
H. Hurni, 1987

of how different disciplines could best cooperate in a mutually supportive way in the search for solutions to the problem. Even more fundamental was the question whether solving the *lavaka* problem in all the areas where the phenomenon occurred is necessary to achieve sustainable development. What measures are best suited to optimise ecological, social and economic objectives? Which groups of actors need to be involved in order to achieve social goals?

These questions made it clear that disciplinary and interdisciplinary methods were no longer sufficient when it came to establishing or defining values and norms. Collaborative research made it necessary to give more emphasis to social dimensions. Just as development cooperation was increasingly using participatory methods, research approaches began to match local knowledge with scientific knowledge beginning in the mid-1980s, with the aim of generating new knowledge in dialogue with local decision-makers. The process of compiling, combining and developing concepts has done much to shape the work of research partnerships in recent years, and is increasingly determining research approaches. The NCCR North-South (see Chapter 1) has benefited greatly from this challenge.

## **2.2 The significance of transdisciplinarity in sustainability-oriented research for development**

Previous reflections on research in concrete development contexts, as well as the example of the *lavakas* in Madagascar, allow us to propose an initial description of transdisciplinarity as a concept associated with a requirement for the topical, methodological and social openness of research processes. This requirement arises from the demand that research contribute to the understanding, and particularly to the solution of concrete and complex development problems.

However, it is difficult to provide a further precise description of transdisciplinarity beyond this general requirement for openness. One reason is that the concept has positive social and research-related connotations, and its meaning is thus exaggerated. Moreover, it is difficult to make the concept more concrete and operational, owing to the variety of positions and definitions associated with transdisciplinarity that have arisen, not least of all as a result of the positive value it has in social terms.

Three basic positions have influenced discussions of transdisciplinarity (see Häberli et al., 2001). First is the idea that transdisciplinarity builds a bridge between the natural and technical sciences on the one hand, and the social sciences and humanities on the other. This position was developed in the late 1970s in answer to the exaggerated use of the term “interdisciplinarity”, and emphasises the need to overcome paradigmatic and methodological contradictions. A second position, established somewhat later, addresses the demand that research must be explicitly concerned with social and political processes. This position puts less emphasis on bridges between the sciences than on links between science and society. The third position combines the first two and calls for research processes that adopt a broad interdisciplinary approach and interact with the societies concerned in addressing complex problems.

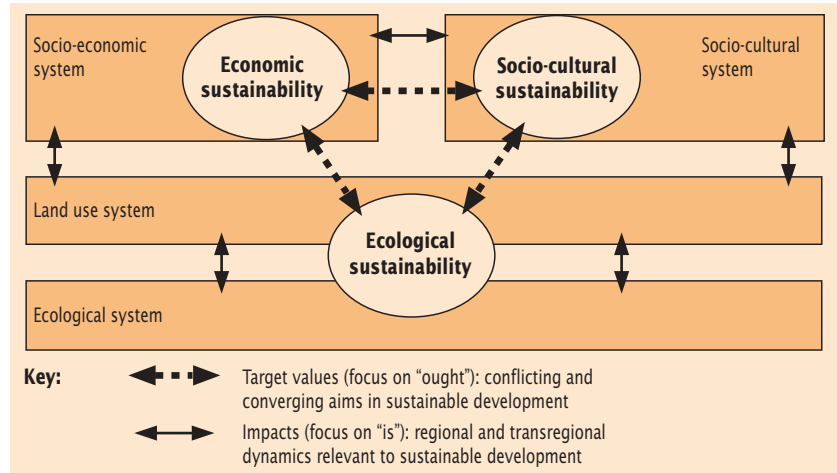
Against the background of these diverse positions, and taking account of the perspective of research for development (or development research), we propose a pragmatic approach. The aim of this approach is oriented research that will make concrete contributions to sustainable development. Although the term “sustainable development” (WCED, 1987; see Box in Chapter 1, p. 14) is quite vague and broadly applied, certain fundamental requirements for its application to development research can nonetheless be deduced.

Figure 2 on page 36 summarises the concept of sustainable development, which can be described in terms of economic, socio-cultural and ecological values. These dimensions form a so-called “magic triangle” that defines how inter- and intra-generational equity is to be achieved. Sustainable development is thus primarily a normative concept used to negotiate and establish values and aims in processes of development. But in addition to a focus on values (on what “ought to be”), the concept also has a focus on impacts (on what “is”). According to this, concrete values on scales of values in the magic triangle depend on the dynamics of the man-environment system.

Several conclusions can be drawn from this brief description:

- (a) As sustainable development is primarily a normative concept, there is a question of who establishes the relevant norms and anticipates future norms where necessary. As it turns out, the answer to this question always leads to a specific social context. In other words, sustainable development can only be meaningfully understood and negotiated in a particular social context.

Fig. 2  
Focus on values  
and concrete  
impacts in the  
magic triangle of  
sustainable  
development.  
Source:  
Wiesmann, 1998



(b) As scales of values are an integral part of the dynamics of an economic, social and ecological system, there is a basic inherent potential for conflict in the aims of sustainable development. In other words, sustainable development is preconditioned upon evaluation of the dynamics in man-environment systems, and negotiation of conflicting aims.

Consideration of these points makes it possible to deduce concrete requirements for sustainability-oriented research with a focus on development:

- Development research requires a context-specific approach that simultaneously allows the possibility of global referencing.
- Development research must begin with explicitly negotiated scales of values relevant to development. This means that issues must be determined as the result of interaction with the societies concerned.
- The potential for conflict in the magic triangle requires development research to include and link together perspectives and approaches from the natural and social sciences, as well as from the humanities.
- The search for solutions to problems in development research must take place in close collaboration with the actors and social groups concerned, thereby allowing the use of knowledge and capacity outside the realm of science.

These four requirements give transdisciplinarity a concrete, pragmatic meaning: transdisciplinary development research is interdisciplinary, context-specific and participatory, both with respect to problem identification as well as in the search for and implementation of research-based solutions to development problems.

### **2.3 The syndrome approach as a starting point for transdisciplinary development research**

The above considerations allow to suggest that transdisciplinarity in development research is not an empty political phrase but a necessity. Consequently, there is a need to confront the question of how to integrate transdisciplinarity in development research. This requires focusing on the level at which the conceptual principles of research are established, as well as the level at which specific research procedures are organised and executed. Some ways of answering this question are explored in the NCCR North-South (see Chapter 1). The framework of the programme is rooted in the “syndrome concept” (*Syndromkonzept*) originally developed by the German Advisory Council on Global Change (WBGU, 1997), and further refined by the NCCR North-South. The syndrome concept was originally built on several basic assumptions: it postulates that certain core problems of non-sustainable development occur in specific spatial and social contexts. These problems occur in particular combinations, and similar combinations of core problems are found in different contexts. A typical “cluster” of core problems is accordingly designated as a “syndrome of global change”.

Table 1 on page 39 illustrates how these basic assumptions are specifically integrated into the research approach defined by the NCCR North-South. Studies are now being undertaken in three important syndrome contexts – urban and peri-urban, semi-arid, and highland-lowland – to determine whether core problems of non-sustainable development have amalgamated into one or more clusters, and whether approaches can be developed to mitigate the resulting syndromes.

A syndrome approach of this sort offers a meaningful conceptual framework for the transdisciplinary process required in development research concerned with sustainability. The following principles, among others, are crucial to this approach:

- The selection and description of essentially normative core problems of non-sustainable development in specific contexts are the entry point for syndrome-oriented research for development. This requires explicit interaction between science and society with respect to these core problems, at the beginning of the research process. In other words, this interaction makes the normative basis of the research process explicit and thus open to critical examination and negotiation.
- The basic assumption of the syndrome approach – that core problems can occur in several local situations in comparable combinations – offers a way out of the ideographic trap of sustainability, according to which each case is unique and that therefore no generalisation is possible. As illustrated in Figure 2, sustainable development can only be meaningfully defined and addressed in specific contexts and situations. The syndrome concept gives this particularised approach a general frame of reference in global terms.
- The assumption that a cluster of core problems can be typified is supported by the hypothesis that comparable causes, dynamics and processes underlie a syndrome that occurs in different contexts. This makes it possible to establish a problem-oriented definition of a system, as well as a meaningful ordering of research questions, during the process of development research. Thus the syndrome approach can help find a way out of the systemic trap of sustainability, according to which everything is interconnected.
- The potential of the syndrome approach for reduction and structuring of complex interconnections opens perspectives for the mitigation of syndromes. First, it is possible to identify meaningful sectoral or multi-sectoral approaches to problem-solving for complex problems. Secondly, appropriate structures of communication and negotiation can be developed with different categories of actors and other social groups concerned.

The arguments presented here underscore the fact that the syndrome approach provides an answer to the requirements cited above for transdisciplinary, sustainability-oriented research for development. It combines a context-specific approach and a global frame of reference based on negotiable scales of values, links natural science perspectives and approaches with perspectives and approaches in the social sciences and the humanities, and facilitates participatory problem-solving.

Table 1

Scientific realms	Syndrome contexts			Core problems
	Urban and peri-urban	Semi-arid	Highland-lowland	
Political & institutional	1. Contradictory policies and institutional barriers 2. Hindering power structures 3. Poor local empowerment/governance			Core problems of non-sustainable development and syndrome contexts as postulated in the programme proposal of the NCCR North-South, to be revised in the regional workshops (cf. Table 1 in Chapter 3, p. 51, and Chapter 13, p. 383 ff).
Socio-cultural & economic	4. Social and ethnic tensions and conflicts 5. Limited innovative capacities 6. High social and economic disparities 7. Problems of market integration			
Population & livelihood	8. Poverty and insecurity of livelihoods 9. Health problems and infectious diseases 10. Population pressure and migration			
Infrastructure	11. Poor environmental services & infrastructure 12. Poor environmental sanitation 13. Problems of access to natural resources			
Bio-physical & ecological	14. Decreasing availability of freshwater 15. Increasing land degradation 16. Loss of biodiversity 17. Risks of natural hazards and climate change 18. Overuse of renewable sources of energy			

Source: NCCR North-South, 2000



## 2.4 Concrete transdisciplinary research in the NCCR North-South

The research framework of the NCCR North-South, which provides a concretisation of transdisciplinarity in sustainability-oriented research for development, has attracted international interest. While transdisciplinarity is one of the basic principles used to deal with the concerns of different groups affected by syndromes, the alternating use of transdisciplinary, interdisciplinary and disciplinary forms of research is crucial in terms of specific implementation.

Fig. 3  
Emphasis of  
methods during  
the course of  
research involving  
specific discipli-  
nary and trans-  
disciplinary  
approaches.  
Source: NCCR  
North-South, 2000

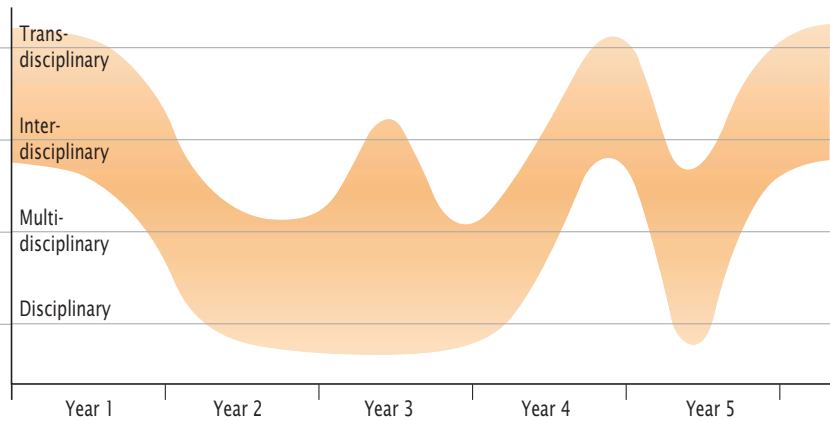


Figure 3 provides an overview of how the different types of research cooperation are being used in a chronological order. As already mentioned in Chapter 1, in the regional workshops of the “Syndrome Pre-Synthesis Project” (SPSP), an inter- and transdisciplinary methodology was used to prepare regional research partnerships. These activities allowed to realise the first step of the NCCR North-South programme (Year 1 in Fig. 3; see also Chapter 3). Following these regional SPSP workshops, research themes were identified by each region, syndrome context and scientific realm as a first activity of the NCCR North-South programme, based on which PhD and post-doc theses were defined, evaluated by the programme’s Board of Directors, and endorsed (Year 2). Currently (i.e. 1 July 2003), the NCCR North-South is at the beginning of Year 3, with a majority of activities consisting of disciplinary studies conducted by individual researchers. In addition, as

intended in Figure 3, an interdisciplinary symposium was held in June 2003 in Switzerland, focusing on “Complexity and generality in development-oriented research”. The general themes discussed in relation to the NCCR North-South programme were: (a) “Concepts, approaches and complexity”, (b) “Syndromes, mitigation and generality” and (c) “Transdisciplinarity and sustainable development”. In Year 4, an attempt will be made to feed individual research results back into a transdisciplinary process involving all researchers and selected stakeholders in regional conferences. Year 5, finally, will focus again on in-depth studies related to refining objectives derived from the transdisciplinary process of Years 1 and 4, in order to define the second programme cycle (Phase II) of the NCCR North-South.

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### 3 **The Transdisciplinary Approach to Regional Pre-syntheses: A Basis for Syndrome Mitigation Research**

Urs Wiesmann and Hans Hurni

#### **Abstract**

Eight regional workshops and the resulting pre-syntheses for the eight regions worldwide defined as “Joint Areas of Case Studies” (JACS) constituted the core of the “Syndrome Pre-Synthesis Project” (SPSP), the aim of which was to provide a transdisciplinary foundation for the proposed NCCR North-South. An approach and a methodology for the regional workshops were designed on the basis of initial conceptual preparation that linked the concepts of “sustainable development” and “syndrome mitigation” and explored their interrelations. The workshop participants represented a broad range of research and development institutions. They formed regional think tanks whose tasks were to critically review and discuss the proposed framework of the NCCR North-South, then address problems of sustainable development in the various syndrome contexts in the region, weight and cluster the problems, and identify the type of research that would help mitigate syndromes and enhance sustainable development in each region. In doing this, the workshops built on the broad range of knowledge, expertise and experience of participants. Later, selected participants further refined workshop results and drafted pre-synthesis reports that anticipated the specific requirements and research focuses of the NCCR North-South for the respective JACS regions. The resulting products and debates revealed a diversity that is a source of innovation and an expression of lively and productive research partnerships within the NCCR North-South.

### 3.1 The “Syndrome Pre-Synthesis Project” (SPSP): an opportunity

The Syndrome Pre-Synthesis Project (SPSP) discussed in the present publication provided a unique opportunity to initiate transdisciplinary processes in the regions and among the partners involved in the NCCR North-South (see Chapters 1.6 and 1.7). This opportunity arose from the specific positioning of the SPSP project between the development of the NCCR North-South proposal (1999–2000) and the approval and launching (in late 2001) of this long-term partnership programme.

The transdisciplinary processes within the SPSP were initiated in three steps that significantly refined the initial approach of the NCCR North-South and concretised the programme’s inaugural phase.

1. *Conceptual workshop*: In a first step, the “syndrome concept” (*Syndromkonzept*) developed by WBGU (1997) was analysed and adapted during a conceptual workshop held in Switzerland in early April 2001. In particular, potential core problems occurring in the syndrome contexts selected by the NCCR North-South – urban and peri-urban, semi-arid, and highland-lowland (see Chapter 1.5) – were identified, and these core problems were ranked in order to assess their importance and urgency. This formed a conceptual, methodological and thematic basis used by the participating stakeholders – primarily the Swiss co-applicants of the NCCR North-South and their closest collaborators – to develop an approach for carrying out regional workshops in the proposed “Joint Areas of Case Studies” (JACS; see Chapter 1.6).
2. *Regional pre-synthesis workshops*: In a second step, eight regional workshops were held in the JACS regions, each lasting about three to four days and coordinated by one of the NCCR North-South co-applicants and his or her regional partners. The participants, who were invited as regional representatives of a broad range of research and development institutions, formed regional think tanks. In a structured appraisal process that built on the broad range of knowledge, expertise and experience represented by participants, the think tanks addressed problems of sustainable development in the various syndrome contexts in each region, weighted and clustered the problems, and identified the type of research that would lead to mitigation of syndromes and enhancement of sustainable development in each region. Selected participants further

refined workshop results and drafted pre-synthesis reports that anticipated the specific requirements and research focuses of the NCCR North-South for the respective JACS regions.

3. *Concretising the inaugural phase of the NCCR North-South:* In a third step, selected colleagues from all JACS regions attended an international conference in Grindelwald, Switzerland that also marked the start of the NCCR North-South. At this conference the eight pre-syntheses were presented; their implications for the conceptual framework and the concrete research projects of the NCCR North-South were negotiated and corresponding results were incorporated. This formed the basis of the present publication, which presents the eight pre-syntheses and the refined conceptual framework. The conference also made it possible to establish research priorities, which have meanwhile determined the selection in all JACS of suitable candidates for research grants.

The chance to use these three steps to implement the SPSP and carry out the project in the phase between the development of the proposal and the start of the NCCR North-South was a decisive opportunity, both in itself and with regard to the initiation of the long-term research partnership programme. The SPSP resulted not only in regional pre-syntheses of syndrome contexts and syndrome mitigation research; it also made it possible to refine and concretise the conceptual framework of the NCCR North-South, and to specify research questions, approaches and projects. Most importantly, the SPSP made it possible to contextualise the general approach to research in the JACS regions suggested in the NCCR North-South proposal, and to reframe it in a transdisciplinary process. Finally, this process also served to create and broaden ownership of the NCCR North-South – a key prerequisite of any research partnership programme (see Chapter 1.4).

### 3.2 The syndrome concept: a flexible and innovative basis

Why was it crucial to address the question of contextualisation and to broaden ownership through the SPSP? And how does this relate to the general conceptual framework of the NCCR North-South, with a focus on syndrome mitigation? At this stage, it is important to briefly evoke the reasons that led to choosing the “syndrome concept” (*Syndromkonzept*) as an integrative framework for the NCCR North-South. On the one hand the programme proposal was developed under specific circumstances; and on the other, there was a need to choose a conceptual framework that makes it possible to combine inter- and transdisciplinary methods with in-depth disciplinary research.

When the Swiss Association of Research Partnership Institutions (SARPI) decided in 1999 to compete for designation of a Swiss National Centre of Competence in Research (NCCR), it had to take into account certain conditions and circumstances. First, it was clear that SARPI was competing with programmes focusing on different types of research thought to have comparative advantages for Switzerland at the international level, and not with other programme proposals dealing with development issues and/or collaboration between the North and the South. Second, SARPI members were aware that the proposal only stood a chance if it could convincingly show that joining forces among Swiss research institutions active in North-South collaboration would lead to significant added value when compared to single institutions’ potentially high-quality outputs. Finally, SARPI had to deal with the very unfortunate situation that time and circumstances did not allow for participatory development of the NCCR North-South proposal involving partners from developing and transition countries from the outset.

The specific circumstances under which the proposal was developed and the highly competitive environment had implications for the institutional network that participated in elaborating the proposal. These circumstances also had a major impact on the choice of the overall conceptual framework. While it was impossible to develop the proposal in a truly participatory manner, the structure of the NCCR North-South relied on Swiss institutions with a long record of research partnerships and consolidated networks of partners in the South. This made it possible to indirectly integrate the views of these partners into the proposal.

The circumstances also influenced the choice of conceptual framework for the NCCR North-South: a framework had to be found that (1) was convincing beyond the circles directly involved in development-oriented research partnerships, (2) could be relevant to the political level in Switzerland and appeal to the country's sense of global responsibility, (3) indicated areas in which integrative added value could be expected from the proposed NCCR North-South, and (4) – most importantly – left enough room to accommodate the needs and views of partners in developing and transition countries, and fulfil the principle of partnership-based and participatory research (see Chapter 1.4).

Beyond these requirements SARPI was looking for a framework that made it possible to combine integrative approaches with in-depth research. This was based on the shared conviction and experience that the only path to innovative solutions and research-based problem-solving strategies in the complex field of sustainable development is through a combination of, and iteration between, in-depth disciplinary and interdisciplinary research on the one hand, and integrative, transdisciplinary research on the other.

Against this background, SARPI borrowed the concept of “syndromes of global change” from the German Advisory Council on Global Change (WBGU, 1997), using it as the starting point for the development of the conceptual framework of the NCCR North-South. The original “syndrome concept” was considerably modified in the proposal for the NCCR North-South, in order to meet the above requirements. The most important modification was the inclusion of a conceptual relation to the framework of sustainable development, and a focus on mitigation rather than analysis of syndromes of global change (see Chapter 2). The choice of this framework underlined some basic methodological and normative decisions made by SARPI when drafting the proposal:

- (1) The concept of “syndromes of global change” implies links or relations between trends and dynamics at the global level and specific constellations and development problems in concrete situations. Besides the importance of this systemic view as a scientific hypothesis, the assumption of such relations is a clear appeal to Swiss authorities not to neglect global responsibilities when developing an instrument of national research policy such as the NCCRs.
- (2) However, as is the case when the term “syndrome” is used in medicine, the concept of “syndromes of global change” underlines that these rela-



tions are neither deterministic nor unilateral, but complex, interwoven and “messy”. This implies that actors have a certain degree of freedom, and that there is a potential for participatory action and influence of development activities within concrete situations. The use of the term therefore underlines the intention – and the necessity – of bridging the gap between general and specific aspects of concrete constellations of core problems. This is important for the NCCR North-South’s scientific position.

- (3) In the NCCR North-South proposal, the focus on mitigation rather than on analysis of syndromes of global change underlines the intention – and the imperative – that research contribute not only to understanding processes but also to enabling action and solutions. The use of the term “mitigation” also cautions against expectations and calls for modesty in view of the above-mentioned complexity. At the same time it gives scope for participatory and innovative approaches and processes in concrete situations.

These considerations underline that it was not the intention of the NCCR North-South proposal to provide an integrative theoretical framework for its activities. Instead, the initiators of the programme decided to launch the NCCR North-South within a conceptual framework that highlights some basic positions taken by SARPI, indicates in what direction added value can be generated, and provides guidance and flexibility for creative, innovative and transdisciplinary processes in the NCCR North-South. Choosing such a conceptual framework was a prerequisite to redressing the unfortunate fact that partners from developing and transition countries were only implicitly involved in developing the proposal. As modified by the programme initiators, the “syndrome concept” enabled differentiation and contextualisation of the NCCR North-South’s approaches, while at the same time broadening ownership of the programme through the SPSP project.

### **3.3 Core problems of non-sustainable development: an entry point**

The “syndrome concept” as adapted and modified in the NCCR North-South proposal is very closely linked to, and builds on, the conceptual framework of sustainable development (see Chapter 2.2). In other words, the underlying reason for adopting the syndrome concept is to foster sustainable development. Sustainable development is defined here as encompassing three dimensions: ecological sustainability, socio-cultural and socio-political sustainability, and economic sustainability (see Fig. 2 in Chapter 2). Independently of how these dimensions are selected and the processes and dynamics that govern them, it is necessary, first of all, to realise that sustainability is a normative concept. It entails defining values and setting goals for development in the three above-mentioned dimensions. The normative aspect of sustainability requires that questions such as “who defines values and sets goals”, and “who participates in negotiations on conflicting values and goals” need to be asked systematically, taking into account that the answers come from people who are members of a society concretely affected by the issues at stake. In other words, sustainable development only makes sense and can be meaningfully specified in a concrete societal context. Contextualisation of the three dimensions of sustainability mentioned above, and related concrete social negotiation processes, are the core of sustainable development. Another conclusion is that sustainable development has a specific meaning in each concrete societal context, and therefore also requires context-specific action (Wiesmann, 1998).

The modified syndrome concept presented in the NCCR North-South proposal basically acknowledges the fact that sustainable development is context-bound (Hurni and Wiesmann, 2001). However, it also postulates that development trends perceived as non-sustainable within a concrete societal context are at least to some degree linked to global trends and dynamics. Even without further specifying the links thus postulated, this hypothesis leads to the underlying premise of the NCCR North-South’s syndrome approach: similarities between patterns and clusters of problems of non-sustainable development can be identified in various situations and contexts that have similarities. If this premise is sound, then the shared pattern of problems can be called a “syndrome”, and the specific local circumstances in which a syndrome is identified can be said to constitute a “syndrome context” (NCCR North-South, 2000). The term “syndrome” is thus based on the hypothesis that these situations are exposed to similar driving forces and

underlying causes that might be related to global dynamics, trends and dependencies (Reusswig, 1999). This in turn implies that similar ways of achieving more sustainable development can be developed for contexts sharing comparable patterns of problems of non-sustainable development. The aim of “*mitigating* syndromes of global change” can be pursued by searching for such ways of achieving more sustainable development (NCCR North-South, 2000).

Given the relation between the conceptual frameworks of “syndromes of global change” and “sustainable development”, it is obvious that defining and assessing core problems of non-sustainable development in concrete contexts is an extremely important and decisive entry point in syndrome mitigation research. Such assessments make it possible to address the following questions: a) Can similar clusters of problems of non-sustainable development and underlying processes, dynamics and trends be identified in several concrete contexts? b) If this is the case, does it imply that similar and congruent ways of mitigating syndromes in a participatory manner might exist?

During the conceptual workshop in Montézillon, Switzerland, that initiated the SPSP (see Chapter 3.1 above), participants agreed that identifying core problems of non-sustainable development could serve as a key entry point for designing syndrome mitigation research and therefore also for elaborating the planned regional pre-syntheses. Against the background of the normative dimension of sustainable development, the selection of this entry point implies that transdisciplinary negotiations must be the starting point for syndrome mitigation research in concrete contexts. Elaboration of a regional pre-synthesis for syndrome mitigation research must therefore be based on much more than a simple synthesis of existing knowledge and the identification of research gaps from the point of view of the participating disciplines. Such a pre-synthesis must be based on an explicit and negotiated identification of what dimensions of non-sustainable development are relevant within the specific context. This transdisciplinary negotiation process is a normative act in which selection of core issues for research is explicitly declared to be a value-based process.

The Montézillon conceptual workshop established an extensive common list of potential core problems, arguing that this list could foster transdisciplinary negotiations in the individual regional pre-synthesis workshops and increase the possibility of identifying similarities and differences between

clusters found in the different regions and syndrome contexts addressed in the JACS of the NCCR North-South. This common list suggests where sustainability problems might – but need not necessarily – occur in different contexts and at various degrees of acuteness. The common list of potential core problems elaborated during the Montézillon conceptual workshop (see Table 1) was also an important means of promoting interdisciplinary exchange and collaboration among the various participating Swiss research institutions.

Table 1

Scientific realms	Checklist of potential core problems of non-sustainable development	Common list of potential core problems of non-sustainable development; version negotiated among Swiss partner institutions of the NCCR North-South at the SPSP conceptual workshop in Montézillon, Switzerland, 2 April 2001.
Political & institutional	<ol style="list-style-type: none"> <li>1. Dominating and conflicting world views and ethical values</li> <li>2. Contradictory and inadequate policies</li> <li>3. Inadequate institutions</li> <li>4. Governance failures and insufficient empowerment of actors</li> <li>5. Unequal distribution of power and resources</li> </ol>	
Socio-cultural & economic	<ol style="list-style-type: none"> <li>6. Social and ethnic tension</li> <li>7. Violent conflicts</li> <li>8. Unused potential of innovative capacities and existing knowledge</li> <li>9. High socio-economic disparities</li> <li>10. Incompatible and fragile economic systems</li> <li>11. Dominance of the existing global economy</li> </ol>	
Population & livelihood	<ol style="list-style-type: none"> <li>12. Constraints on human rights and individual development potential</li> <li>13. Poverty and insecurity of livelihoods</li> <li>14. Health risks and vulnerability to ill-health</li> <li>15. Population pressure and migration</li> </ol>	
Infrastructure & land use	<ol style="list-style-type: none"> <li>16. Poor water supply and environmental sanitation</li> <li>17. Lack of adequate infrastructure (including energy supply)</li> <li>18. Problems of access to land and natural resources</li> </ol>	
Bio-physical & ecological	<ol style="list-style-type: none"> <li>19. Inadequate availability of freshwater</li> <li>20. Land degradation</li> <li>21. Pollution and overuse of renewable natural resources</li> <li>22. Loss of biological diversity</li> <li>23. Risks of natural hazards and climate change</li> <li>24. Depletion of non-renewable natural resources</li> </ol>	

When compared with the original list of core problems presented in the NCCR North-South proposal (see Table 1 in Chapter 2, p. 39), the list of potential core problems of non-sustainable development shown in this table clearly indicates that the Montézillon workshop led to a refinement of the NCCR North-South's original syndrome approach. The number of potential core problems increased from 18 to 24; moreover, they underwent reformulation, indicating that participants had discussed related conceptual issues in a very detailed manner. Further modifications, refinements and evaluations of this list in the regional workshops (see Chapters 4–11) were also a direct result of the transdisciplinary process initiated by the SPSP and an expression of the progress achieved by the project. An analysis and synopsis of the process is presented in Chapter 13.

### **3.4 Unity and diversity in regional approaches and pre-syntheses**

Based on the methodological experience gained in the conceptual workshop in Montézillon, the eight regional pre-synthesis workshops formed the core of the SPSP project. These workshops took place between May and September 2001 in all Joint Areas of Case Studies (JACS) of the NCCR North-South (see Chapter 1.6), with the exception of the JACS situated in the Swiss Alps (see Chapter 12). These workshops brought together representatives of a broad range of research and development institutions who formed regional think tanks in order to design a framework for long-term collaborative research and action for sustainable regional development in the respective JACS regions. As outlined in Chapter 3.1, these regional workshops offered a great opportunity to anticipate the focuses of syndrome mitigation research: by elaborating regional pre-syntheses and initiating transdisciplinary processes, the proposed general approach in the JACS regions was contextualised and reframed; moreover, ownership of the NCCR North-South was broadened.

The methodology for the transdisciplinary regional workshops and subsequent formulation of pre-syntheses developed in Montézillon included the following steps and expected outputs:

1. *Selection and definition of "syndrome contexts" in the JACS regions:*  
Political considerations regarding the role and experience of Swiss development cooperation and research led the initiators of the NCCR North-

South to select three major syndrome contexts in which syndrome mitigation research should concentrate. These broad societal, economic, political and ecological contexts – urban and peri-urban regions, semi-arid regions in transition, and highland-lowland interactive regions (see Chapter 1.5) – were not defined as strict analytical categories for the programme. The Montézillon workshop thus suggested to the participants in the regional workshops that one or several syndromes might be identified in each of these contexts. The first step in the regional workshops was therefore to describe these contexts in each JACS region, and discuss whether sub-contexts needed to be defined to accommodate the fact that relatively homogenous and specific clusters of core problems of non-sustainable development might exist. Participants then had to select the most important contexts and sub-contexts they had described, using an explicit, value-driven transdisciplinary process of negotiation.

2. *Definition and appraisal of core problems for the selected syndrome contexts:* In a further transdisciplinary step that consisted of appraisal methods and built on the knowledge, expertise and experience of each think tank, participants then defined core problems of non-sustainable development in each syndrome context and sub-context selected, and assessed the importance and urgency of each problem. One important issue was to determine whether a problem had been defined normatively as a core problem of non-sustainability independently of its systemic functions. For example, “poverty” is a sustainability problem that must be mitigated, independently of its various possible functions within the sustainability system. Ranking the severity of the core problems per selected context was done on a global scale ranging from (1) = “not relevant by global comparison” to (7) = “worst case by global comparison”.
3. *Consolidation in a common list of core problems of non-sustainable development:* The lists and definitions of core problems identified in the selected contexts were then consolidated in a single common list per workshop. This common list of core problems of non-sustainable development did not simply result from summarising analyses of syndrome contexts, but it resulted from a complex process of negotiation within the think tank. Indeed, such a list represents a combination of experience, knowledge and normative definitions. Elaboration of such a list is therefore a major transdisciplinary step towards a common and explicit view and understanding of sustainable development in a specific region and by a specific think tank. The resulting list in each case was also an

important source of broadened ownership of the NCCR North-South in the JACS regions. A further outcome of this process is the productive debate and the institutional integration of Individual Projects (IPs) and JACS in the NCCR North-South that resulted from a comparison and merging of the lists elaborated in the different JACS workshops (see Chapter 13).

4. *Elaboration of a research agenda for mitigation approaches in the selected syndrome contexts:* As already mentioned above, the primary focus of the NCCR North-South is not the analysis of syndromes as such, but research for mitigating syndromes of global change. Therefore, the JACS workshops were asked to creatively identify research projects that could contribute to mitigating sets or clusters of core problems identified in the selected syndrome contexts. The workshop approach thus built on the broad available regional knowledge and experience of sustainability-oriented research and development. In a further step, participants were asked to compile the proposals for research projects in a draft agenda for mitigation research in the selected syndrome contexts in the JACS, by setting priorities according to perceived importance and urgency. The eight resulting draft research agendas became a cornerstone for the detailed research design of the NCCR North-South (see Chapter 14).
5. *Formulation of a pre-synthesis report for the respective JACS region:* To enable comparative assessment and integrative debate within the overall NCCR North-South, a common structure was proposed for the pre-syntheses of the regional workshops (see Chapters 4–11). This structure required systematic presentation of workshop outputs according to the steps mentioned above, and provision of additional information to supplement the work by the think tanks where necessary. In particular, reporters were asked to include an account of the state of research in the fields covered by the proposed research agenda for mitigation approaches, in order to guarantee uniqueness at the international level and prevent duplication of research by the NCCR North-South.

The above five components of the methodology for regional workshops and pre-syntheses constituted a standard procedure that was not completely binding for the think tanks in the JACS regions. As explained in Chapter 3.2, the regional workshops provided an opportunity to contextualise syndrome mitigation research, while also creating NCCR North-South ownership by

the partners in the JACS. This opportunity implied that the respective think tanks had to feel free to discuss the conceptual framework, adapt it to their needs and thus also modify the standard regional workshop approach. Almost all workshops took advantage of this freedom, though to very different degrees, thereby creating productive diversity and a questioning attitude within the overall frame of the NCCR North-South.

Most of the workshops shortened or modified one or more of the steps in the procedure. Apart from this, the following four major triggers of creative diversity can be distinguished:

- *Specific sectoral composition of the think tank:* As the NCCR North-South builds partly on existing competence and partnerships in the JACS regions, it is obvious that syndrome assessments and research designs produced by each workshop reveal at least a slight topical bias. A few workshops decided to concentrate closely on one core topical focus, probably because the respective think tanks were composed accordingly. The advantage of such a modified approach is that it results in a more in-depth analysis and research design in the selected field; its disadvantage for the NCCR North-South programme is the resulting difficulty to integrate the results into the debate on overall sustainability issues and syndrome mitigation within the framework of the NCCR North-South.
- *Addition of new focuses to the pre-synthesis approach:* Some think tanks decided to add aspects and enter debates that could not be subsumed under the standard approach. Most important was the attempt in the South Asia workshop to include an assessment of issues that can be interpreted as having potential to promote sustainable development. Although the resulting list of issues cannot be compared with other pre-syntheses, it opens an important debate on the possibilities and limits of integrated problem-oriented research approaches within the NCCR North-South and other such programmes.
- *Modification of the syndrome contexts or omitting selection:* In some workshops the think tanks decided to radically modify the three general contexts proposed in the NCCR North-South proposal, or to neglect them altogether. This change was motivated by the fact that the three syndrome contexts had labels with a strong geographical bias. The change triggered a productive debate on the dimensions that should characterise a syndrome context. However, apart from the fact that this choice affected a



basic pillar of the NCCR North-South proposal that had been agreed on for strategic reasons, it also increased the difficulties in finding a common ground for discussion and to integrate these workshops and their pre-syntheses within the general framework of the SPSP.

- *Critique of the “syndrome concept”*: In most of the workshops the basic assumptions of the “syndrome concept” underwent critical examination, clarification and modification. However, in some cases criticism was so basic that it could not be accommodated in the flexible conceptual framework as proposed for the future NCCR North-South. Such basic criticism made it difficult for participants not to completely reject the standard approach for the regional workshops and respective pre-syntheses. However, it also triggered a productive reflection on how the NCCR North-South can overcome the connotation of pathology conveyed by the term “syndrome” and enhance its pro-active and empowering approach to syndrome mitigation.

At first glance, it may seem that the diversity resulting from the above types of modification of the approaches to the regional workshops and pre-syntheses hinders comparison and integration within the overall framework of the NCCR North-South. However, this is only partly true, because all modifications made by the think tanks in the JACS workshops in a desired process of contextualisation and creation of ownership within the NCCR North-South led to creative and productive debates that will eventually enhance the quality of the overall programme and its conceptual framework.

In this sense, one can state that the diversity presented in the following pre-syntheses (see Chapters 4–11) does not impede integration within the overall NCCR North-South; instead, it is a source of innovative potential and an expression of lively and productive research partnerships. Beyond diversity and initial disagreement with certain premises, the eight pre-syntheses also reveal a strong and unifying commitment to integrative, transdisciplinary and sustainability-oriented research for development.

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## **Part II**

# **Regional Syntheses on Contexts of Syndromes of Global Change**





## 4 JACS West Africa

# Urbanisation and Nomadic Lifestyle: Research on Vulnerability and Risks to Improve Well-being at Household and Population Levels

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Fig. 1  
Urban-rural environment in Ouagadougou (Burkina Faso), illustrating all key issues of the JACS West Africa.  
Photo: S. Gerstl



\* On behalf of all the participants of the workshop held in Abidjan, Côte d'Ivoire, in May 2001 (listed in Annex 1, p. 443)

## **Abstract**

In West Africa, major social transformations are taking place as a result of global change. Great pressure on arable land is leading to unprecedented population movements, including an explosive growth of urban centres. The emphasis of the JACS West Africa is on health and well-being, concentrating on two groups that are particularly vulnerable to syndromes of global change: poor urban populations and nomadic communities. The goal is to generate a scientific basis for the improvement of health and well-being in a situation where governments can no longer meet even the most urgent needs for health services and infrastructure. This includes not only addressing questions of disease burdens and health service planning, but also aspects of the bio-physical, ecological, social and political environment. A concept of vulnerability is being developed which combines the epidemiological concept of risk and the perspectives of social sciences, in order to develop strategies to assess equity, poverty and well-being, and to alleviate social, health and economic burdens among population groups living at the margins.



Fig. 2: The JACS West Africa includes the following countries: Côte d'Ivoire, Burkina Faso, Mauritania, Chad, Senegal and Cameroon. Its research and action focus is on the health and well-being of two population groups that are particularly vulnerable to syndromes of global change: poor urban populations in the cities of Abidjan, Ouagadougou, N'Djaména, Saint-Louis and Bobo-Dioulasso, as well as nomadic communities in remote rural zones of Mauritania, Chad, Cameroon.



## 4.1 Introduction to the region of the JACS West Africa

Sub-Saharan Africa is a region of great mineral wealth and agricultural potential, but it is ranked lowest in the world in terms of economic development, social conditions and health (Table 1). The region has suffered severely from global change. Widespread environmental degradation includes the destruction of the remaining rainforests and the clearing of bush in the savannah. Environmental changes have been followed by social changes and large population movements.

The Individual Project 4, “Health and Well-Being” (IP4), which works mainly in the JACS West and Central Africa, is led by the Swiss Tropical Institute in Basel. There are study sites in Côte d’Ivoire, Burkina Faso, Chad and Mauritania, and a coordination office in the Centre Suisse de Recherches Scientifiques (CSRS) in Abidjan, Côte d’Ivoire. IP4 collaborates with IP5 in Senegal (urban issues) and IP6 in Cameroon (livelihood of nomadic populations).

In the study countries, population densities are low in rural areas but there are also overcrowded urban centres (Fig. 3), where 20–50% of the population are living. The area includes large semi-arid regions, with a large population of nomadic pastoralists.

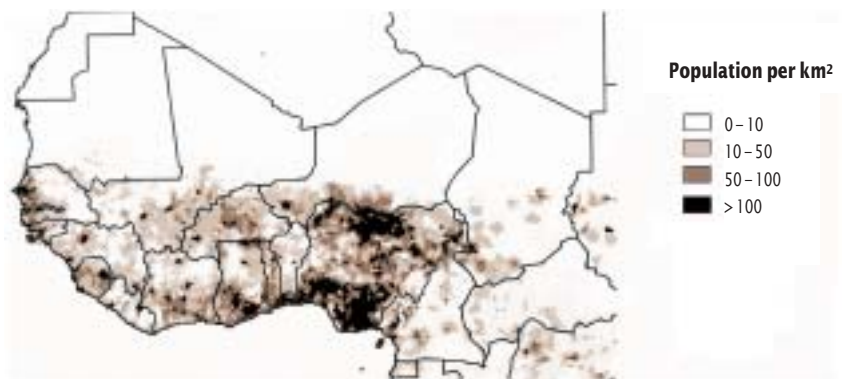


Fig. 3  
Population density  
in West and  
Central Africa.

## 4.2 Selection and justification of core problems

A workshop was held in Abidjan in May 2001, at which all the JACS areas in Central and West Africa were represented. Core problems were identified in a process of discussion that involved scientists from Switzerland – many of whom have lived and worked in Africa – and from all the African countries participating in IP4. The participants were mainly from the public health and veterinary sectors, but the discussion included much broader environmental,

Table 1

	Year	Burkina Faso	Côte d'Ivoire	Cameroun	Mauritania	Chad	Senegal
<b>Geography and social indicators</b>							
Surface (thousand sq. km)	2000	274	322	475	1026	1284	197
Total population (million)	2000	11.5	16	14.9	2.7	7.9	9.4
Annual population growth rate (%)	1990–2000	2.4	3	2.7	2.8	2.9	2.6
Urban population (% of total population)	2000	19	46	49	58	24	–
Annual urban growth rate (%)	1990–1995	12.6	4.9	5.3	5.5	3.5	4
<b>Development and economic indicators</b>							
GDP per capita, at purchasing power parities (USD)	2000	976	1630	1703	1677	871	1510
HDI rank (total 173)	2002	169	156	135	152	166	154
Human Poverty Index (% of population below poverty line)	1989–2000	–	–	40	57	64	–
Population in agriculture male / female (% of labour force)	1980–1982* 1998–2000	92/ 93*	60/ 75*	65/ 87*	65/ 79*	82/ 95*	74/ 90*
Public expenditure on education / health (% of total public expenditure)	1995–1997/ 1998	3.6/ 1.5	5.0/ 1.2	–/ 1.0	5.1/ 1.4	2.2/ 2.3	3.7/ 2.6
Population with access to safe water / adequate sanitation (%)	2000	–/ 29	77/ –	62/ 92	37/ 33	27/ 29	78/ 70
<b>Environmental indicators</b>							
Crop land per capita (hectares)	1997–1999	0.32	0.19	0.42	0.2	0.48	0.25
Area of severe soil degradation (% of country)	2000	47	4	37	26	24	36
Protected area (% of total surface)	1999	10.4	6.2	4.5	1.7	9.1	11.3
Energy consumption per capita (kilogram of oil equivalent)	1999	–	388	419	–	–	318

Some key indicators for the countries of the JACS West Africa.

Sources:  
UNDP, 2002;  
World Bank,  
2002a+b;  
FAO, 2000

social and natural science perspectives. Consequently, the present presynthesis is firmly based on the expertise and experience of the teams working in the JACS West Africa, and hence on the issues related to the well-being of population groups. Health is seen as one of the most sensitive outcome indicators in the approach to analyse and mitigate effects of global change. Syndromes of global change affect everybody, but especially members of particularly vulnerable groups. The studies concentrate on two of these: poor urban populations and nomadic communities. In the rapidly-growing cities, poorer people suffer particularly from the inability of government authorities to provide an adequate infrastructure. The nomadic way of life is increasingly threatened by climatic change and by growing population pressure, which can lead to conflict with sedentary populations. Both groups are socially vulnerable because of illiteracy, poverty and political marginalisation. Central governments rarely offer health or education policies adapted to them.

On the other hand, both city-dwellers and nomadic peoples are important for the development of their countries. Nomadic pastoralism is one way of using marginal ecosystems that could otherwise not be used, and could help to meet increasing demands for milk and meat, but ways must be found to do this without endangering fragile ecosystems. Cities can be agents of social change and engines of economic growth, but in the face of increasing poverty and inequality a new vision and new approaches are required so that they can play this role adequately.

The overall goal of IP4 in the JACS West Africa is to generate a scientific basis for the development and validation of adapted, efficient and innovative strategies that will improve the health and well-being of especially vulnerable groups, and thus help to mitigate the effects of global change. There is a need for basic knowledge about disease patterns, health status, and health services and their use. However, to achieve the project's goals a much wider range of problems must be considered. There is a complex interplay between health and factors such as water supply, housing, sanitation and waste disposal, and basic education. The social and political dimensions are also important, because any attempt to find sustainable and equitable solutions to problems will involve negotiations and treaties between well-off and vulnerable population groups. There is a need to develop a framework for the resolution of conflicts, and to improve local capacities for management and foster good governance (UNDP, 2000).

The 21 core problems finally identified (CSRS-STI, 2001) reflect this wide range of concerns. They are listed in Table 2, and described in detail in the next section.

Table 2

Realms	Core problems (CP)	Syndrome contexts	
		Urban and peri-urban	Semi-arid
Political & institutional	1. Consequences of the privatisation of rain- and wastewater management	+++	0
	2. Conflicts and conflict management between the formal and informal sectors	+++	++
	3. Modalities and practices to occupy open spaces	+++	+
	4. Weak governance at municipality level and insufficient performance of the public system	++	0
Socio-cultural & economic	5. Inadequate access to education and low status of those not enrolled at school	+++	++
	6. Situation of women (education, occupation, status)	+++	+++
	7. Functioning and determinants of informal systems	+++	0
	8. Social exclusion and access to information	+++	++
	9. Insufficient access to health and social services	+++	+++
	10. Excessive cost of health and social services	+++	++
Population & livelihoods	11. Definition and identification of the most vulnerable population groups	+++	
	12. Disease burden and emerging diseases, particularly HIV/AIDS, TB, malaria	+++	+++
	13. Changing disease burden in relation to epidemiological transition (linked with # 12), with an emphasis on interplay of infectious and chronic diseases and mental health	+++	+++
	14. Demographic transition, with an emphasis on migration	+++	+
	15. Unavailability, inaccessibility and inadequacy of health services for nomadic populations	0	+++
Infrastructure & information	16. Housing of vulnerable, poor populations; ownership	+++	0
	17. Lack of essential infrastructure such as water, sanitation, electricity	+++	+++ (water)
	18. Provision of infrastructure in relation to complexity of the formal and informal systems and sub-systems within a municipality	+++	0
Bio-physical & ecological	19. Proximity of nomadic populations to their animals and the agents of zoonoses	0	+++
	20. Flow of products between rural and urban areas	++	++
	21. Reuse and capitalisation of solid waste	+++	0

JACS West Africa – list of core problems according to the research realms and syndrome contexts.

## 4.3 Status and dynamics of core problems

### 4.3.1 Political and institutional realm

*1. Consequences of the privatisation of rain- and wastewater management*  
In many rapidly-growing cities, drainage systems are no longer adequate (Harpham and Tanner, 1995), and many rainwater drainage systems have become wastewater drainage systems as well. At the same time, food production in urban areas has become a vital source of food for city residents, and an essential income-generating activity for many city-dwellers. The reuse of wastewater in urban agriculture has led to health risks not only for the urban farmers and their families, but also for the consumers of vegetables (Cissé et al., 1999; Cissé and Tanner, 2001). Since the municipalities are often unable to provide an adequate infrastructure to manage drainage systems, efforts have been made to tackle the problem through privatisation or by transferring responsibility to the community level (Fig. 4). This calls for a new understanding of the role of social networks and local associations in the cities, and of the dynamics that will ensure the success of privatisation.



Fig. 4  
Cesspit-truck in  
an African city.  
Photo: B. Obrist

*2. Conflicts and conflict management between the formal and informal sectors*  
Rapid change has brought many situations that can lead to conflict, either where existing legislation has not kept pace with new realities, or where different informal, formal and traditional systems interact. In urban areas, traditional systems often aim to transpose rural forms of organisation into an urban situation.

The quality of the goods and services provided by informal systems is often low, but attempts to recognise and improve them may lead to conflicts between informal systems and the official systems. While the crucial interplay between the formal and the informal sectors and their stakeholders has been well described (Pugh, 1996), we lack detailed and comparative analyses at the micro-level within and between different African cities (Fig. 5). Such analyses will help to describe the social web in a rapidly-changing environment and to understand how its dynamics can be used to “build cities and societies” (Hardoy et al., 1990) as well as how roles and responsibilities can and should be reassigned in a way that avoids damaging and wasteful conflict.



Fig. 5  
Water provision in  
an African city.  
Photo: B. Obrist

### *3. Modalities and practices for occupying open spaces*

In African cities, land use policy and the underlying legislation have hardly kept pace with the urbanisation process. Consequently, most new arrivals have to establish sites for housing and economic activities like vegetable-growing without any clear legal basis. The process is partly oriented by traditional structures, for example networks of ethnic groups, and partly by participation in power games and corruption cycles within the public administration and the groupings/associations at the sector/ward level (Baker, 1990; Pugh, 1996). There is a need for analyses how the modalities and practices that determine the occupation of space affect poverty in different settings.

In semi-arid rural areas, increasing pressure on land and competition for fertile spaces and water resources between nomadic and sedentary populations lead to conflicts that can no longer be resolved by the traditional legal sys-

tems alone (Wyss and Zinsstag, 2000). Many traditional rights and contracts between the nomads and settled groups have largely lost their significance. The translation of traditionally recognised migration patterns within a country's legislation and within the social network of a mixed civil society represents a big challenge. Reorganisation and formalisation, with the participation of all concerned, will be crucial for equitable development of both the livestock and the plant production sectors (Yosko, 2001; Lachenmann, 1991).

#### *4. Weak governance at municipality level and insufficient performance of the public system*

Many problems and conflicts stem from the weaknesses of public administration. Personal interests often take precedence over public service ideals, and administration suffers from political centralisation and poor management. However, civil society is now in a much stronger position, which is reflected by a tremendous increase in the number of citizens' organisations and increasing trade union activity. A process of reform is beginning which should adjust public service provision to the needs and management forms of local bodies, and redefine the mission and role of the state and its relations with local collectives, the private sector and the citizens.

Reforms also need to consider poor and marginalised people, who often have a rather distant relationship to government authority. Poor people in urban areas are reluctant to use their limited resources to pay taxes. People in semi-arid rural areas who have practised a nomadic lifestyle for centuries often have only a very limited integration into modern nation-states. On the other hand, governments rarely offer health or education policies adapted to the needs of either poor urban residents or nomadic groups. An important hypothesis is that if appropriate services could be provided, the relationship between these groups and the government would become closer, and this could result in their being better integrated in the development process, and their economic contribution being better valued.

### **4.3.2 Social, cultural and economic realm**

#### *5. Inadequate access to education and low status of those not enrolled at school*

Most of the African settings examined lack educational services that stem from social and cultural logic, the thinking that dictates people's actions and the cognitive systems that they use. Lack of appropriate education can lead

to the marginalisation of certain communities or population strata because they have difficulties in presenting their needs and complaints at higher political levels, and in taking advantage of what health and social services are available.

Before the decision is taken to enrol a child at school, a household will weigh the benefits against the effort required, and the costs in terms of fees and loss of the child's labour. Cultural and social factors also play a part. For example, in Chad it is not unusual to find nomadic groups with no children in school (Wyss and Zinsstag, 2000). This is not only due to their mobility. Another barrier to the utilisation of available services is poor communication and mutual distrust between nomadic groups and governmental structures. Nomadic communities tend to perceive any public communication as an attempt of the state to manipulate them to achieve its goals. In turn, the public services accuse them of not wanting to collaborate with the modern state. This is a major problem, because literacy is one of the key determinants for the inclusion of nomadic pastoralists in a sustainable development process.



Fig. 6  
Fulani women  
in Chad.  
Photo: E. Schelling



### *6. Situation of women (education, occupation, status)*

There was general agreement about the need to examine and improve women's status across social and cultural strata. However, though there was a lot of anecdotal evidence about this, there was a surprising lack of documentation, although women's social and economic role is the key to household well-being and much community development. For example, there are hardly any data on the rate of school enrolment of girls, and the figures that do exist are averages that do not consider variations within areas or between income-groups (World Bank, 2000). In Chad, 40.8% of urban women have at least a very basic education, whereas in rural settings the average figure is 14.8% (DSIS, 2001); but in some areas it is much less, for example in parts of the prefecture of Biltine, where only 2.1% of women have been to school.

Health is another area where women may be at a disadvantage. For example, Hampshire (2002) found that among nomadic groups women cannot always mobilise the social support and resources necessary to obtain health care (Fig. 6).

### *7. Functioning and determinants of informal systems*

Conflict between the formal and informal sectors was discussed above (CP 2). If conflicts are to be successfully managed, it is necessary to identify areas of convergence and divergence between the formal and informal sectors in order to analyse the key determinants that govern the sectors. To perform such an analysis in a highly dynamic urban environment is a major challenge for research on urbanisation. So far, published studies are mainly descriptive and ethnographic (Wyss et al., 2000; Bolay et al., 2000). However, recent efforts have developed a global framework for policies to fight poverty by including the civil society and fully capitalising the informal sector (Merklen, 2001), which will be considered as a basis for analysis.

### *8 / 9. Social exclusion and inadequate access to information and to health and social services*

When people move into cities, the inevitable social reorganisation that ensues often leads to an anonymous individualism that disrupts social cohesiveness. Individualism can be positive for some people, whose economic activities flourish when they are not limited by the control exercised by rural society. However, it excludes others, mainly migrants from rural zones with little formal education and few assets, who often live as part of an impoverished population stratum on the outskirts of cities. Few cities have a specific

policy to provide assistance for the urban poor, who are often also excluded from health and social services (World Bank, 2000).

Nomadic pastoralists make little use of health care structures (Sheik-Mohamed and Velema, 1999; Swift et al., 1990). Though they have had contact with Western-type medicine for many decades they know very little about its nature and its power to prevent a number of infectious diseases. Information adapted to their cultural background and education level is virtually never provided. In addition, the performance of dispensaries in rural areas is often poor (Gilson, 1995), so people may feel it is not worthwhile to go to them, especially as access is often difficult (CP 15).

#### *10. Excessive cost of health and social services*

It is to be expected that the impact of expenditure for health care on household livelihoods and well-being will be considerable, especially among poorer people, but few studies have systematically assessed the impact. Costs include direct costs for consultation fees and drugs, and indirect costs resulting from loss of time and reduced ability to work. There is a need for a better understanding of how households respond to the costs of ill health and how cost governs the health- and help-seeking behaviour of different population groups. The results of such analyses will allow strategies to be designed that can enable people to cope better; they will lessen the risk of impoverishment and will make health systems more equitable.

### **4.3.3 Population and livelihood**

#### *11. Definition and identification of the most vulnerable population groups*

Research in IP4 is aimed at understanding the effects of global change on those groups in a population who are “poor”, “vulnerable” and “at risk”. At the workshop participants recognised that these terms need to be defined, and concepts of risk and vulnerability need to be developed and validated for populations living at the margins. It is also necessary to develop “diagnostic approaches” to identify the most vulnerable people in a population. A framework is needed which can reconcile the epidemiological, social and cultural dimensions of risk and vulnerability.

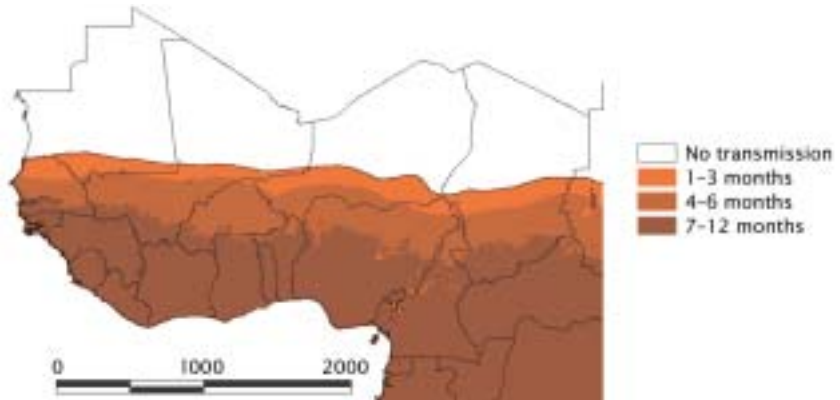
#### *12–14. Disease burden*

Core problems in this area are emerging or increasing diseases, particularly HIV/AIDS, TB and malaria; changes in disease burden resulting from epidemiological transition and demographic changes resulting from migration;

and the interplay of infectious and chronic diseases and mental health. Infectious diseases are responsible for a major proportion of the overall disease burden among both the urban poor and nomadic populations (Murray and Lopez, 1996; Gwatkin, 2000), and the incidence of many infectious diseases such as TB, HIV/AIDS, ARI, diarrhoea and malaria is increasing. Malaria is prevalent throughout the study area (Fig. 7). Malaria, TB and HIV/AIDS represent key determinants of economic and social development and the evidence of their role as “diseases of poverty” is overwhelming (WHO, 2001; Hyder and Morrow, 2001; Reingold and Phares, 2001; Piot and Seck, 2001; Okware et al., 2001). Interventions tailored to the groups most at risk may have a substantial social and economic impact (WHO, 2001).

Fig. 7  
Malaria  
endemicity.

Source:  
MARA/ARMA,  
1999



Urbanisation, poverty and migration result in demographic and epidemiological transitions that can affect disease burdens. Increase in the burden of chronic disease is not necessarily linked to a reduction in the burden of communicable diseases. There has been an increase in mental health problems that has been largely underestimated so far (Desjarlais et al., 1995; McQueen et al., 2001; Tanner and Harpham, 1995; Unwin, 2001; Weiss et al., 2001). Population movements and changes in land use influence the transmission dynamics of zoonotic infections such as rabies (Daborn, 1992).

*15. Unavailability, inaccessibility and inadequacy of health services for nomadic populations*

The delivery of health care to nomadic populations faces special difficulties, and though governments have been urged to develop primary health care for them (Omar, 1992), none of the concepts proposed has been validated for sustainable long-term use (Loutan, 1989). The nomadic way of life makes access to dispensaries in villages difficult, since groups with animals have to avoid areas with crops, and visits to markets often exclude the most vulnerable – women and children. Discrimination against nomads when drugs were in short supply has been documented (Swift et al., 1990). Movement from place to place jeopardises treatment over a long period, for example for TB (Caselle and Galvagno, 1992). Mobile dispensaries are costly. Programmes adapted to the nomadic way of life, using community health workers (CHWs) from nomad communities, are promising since they are less expensive, and women need no special permission to consult a CHW as they would for outside practitioners.

Another promising strategy is collaboration between human and veterinary health services. Veterinarians already visit remote pastoral zones (Wyss and Zinsstag, 2000). Collaboration would mean that the available infrastructure and personnel would be more fully capitalised.

#### **4.3.4 Infrastructure**

*16–18. Housing and other essential infrastructure; provision and ownership*

In urban areas, assuring basic needs has been recognised as a key strategy to alleviate poverty (Merklen, 2001). Reducing the pressure of the daily struggle to fulfil basic needs is a key determinant for initiating sustainable development (Hardoy et al., 1990; Hardoy and Satterthwaite, 1992). Coherent interventions that are based on the needs and demands of the populations concerned are needed, rather than extensive further research. However, there is still a need to optimise the process of participatory action research (ENDA-GRAF-Sahel, 1993), and to reach a better understanding of the lifestyles of households in their traditional and present-day socio-political and economic contexts. In urban areas, with their great variety of formal and informal systems and sub-systems, there are also complex problems surrounding the provision and ownership of essential infrastructure such as water and electricity supplies, and sanitation. Participatory action research has been found to be an effective driving force to understand the interactions between the formal and informal sectors, and to achieve a successful and

efficient strategic alliance between the public and private sectors and the city communities (Wyss et al., 2000).

For nomadic populations, access to water is a basic need that, like land use (CP 3), needs to be part of a new legislative framework.

#### **4.3.5 Bio-physical and ecological realm**

##### *19. Proximity of nomadic populations to their animals and the agents of zoonoses*

The pastoral way of life involves close contact between people and animals, and there is inevitably a high risk of transmission of zoonotic diseases such as tuberculosis (TB) or anthrax (Fig. 8). It is not known how many of the 2 million cases of overt human TB that occur each year in sub-Saharan Africa are due to *M. bovis*, but it seems likely that some of them are (O'Reilly and Daborn, 1995), especially as high rates of infection have been found in some animal populations (Daborn et al., 1996; Schelling et al., 2000), and there is evidence for the transmission of *M. bovis* to people who care for livestock or consume non-pasteurised milk (Mposhy et al., 1983). This public health threat requires urgent investigation through collaborative veterinary/medical research programmes (Cosivi et al., 1995). Population-based molecular studies could describe the transmission patterns of particular strains of *Mycobacterium*, and this could lead to the identification of new methods of control (Cohn and O'Brien, 1998).

Anthrax is also showing an increasing trend that has led to a WHO initiative (Anonymous, 1994) to coordinate control and research in Africa. The disease has a high fatality rate among humans (in an epidemic in Chad, 12% of the patients died; Lamarque et al., 1989). Infection is through eating infected meat or close contact with infected animals or contaminated carcasses, skins and wool. In situations of poverty, people may consume animals that have died of disease. Control methods include systematic vaccination of livestock and education on the risks of handling and consuming contaminated meat.

##### *20. Flow of products between rural and urban areas*

In Central and West Africa, there are wide disparities and inequalities between urban and rural areas and regions (Baker, 1990). An understanding of the interactions between them is needed to understand poverty and to design and validate intervention strategies, such as mutually supportive exchanges of goods and services between urban and rural areas in a given



region. Research on clusters of economically important regional activities may relate to the way household demands (e.g. food or clothing) in an urban centre might be satisfied by local producers, or to sources of substantial export earnings for a given region (e.g. coffee, handicrafts).

Fig. 8  
Fulani nomadic  
pastoralists.  
Photo: E. Schelling

### *21. Reuse and capitalisation of solid waste*

The management and reuse of solid waste is among the most important problems in African cities (SKAT, 1996; Waas and Bidaux, 1999; Bayili, 2001; Rösli et al., 2001). Concepts for sustainable solid waste collection systems must take into account the local social and economic situation, including the control of access to different resources and local preferences for the disposal of garbage (Wyss et al., 2000). It is important to identify approaches that promote synergies between various actors with diverging interests. In recent years many community-based associations for the management of household garbage have been initiated, but though they have contributed to capacity-building at the local level they have not been able to identify ways of sustainable organisation in the field of solid waste management, owing to the lack of an institutional framework and a general concept on how to manage solid waste at municipal level. Innovative concepts are still needed (Pugh, 1996).

## **4.4 Synopsis and syndrome contexts**

The work of IP4 focuses on two contexts where many of the political, economic, environmental and social problems resulting from global change come together: cities and semi-arid settings. Within these contexts, the concern is with the marginalised groups who are most vulnerable: poor people in urban areas and nomadic pastoralists. The core problems described in Section 3 were identified as important aspects of the syndromes of global change, as it affects the health and well-being of vulnerable groups.

The study of health problems touches just one aspect of a multifaceted struggle for survival; poor health is often the ultimate consequence of lack of income and access to sanitation, education and health services, combined with societal change and political unrest. Observed and perceived health parameters are among the most sensitive indicators of all these factors, but they can only be interpreted if the social, cultural, political and economic background is also understood.

A necessary step in meeting the challenge of improving the health and well-being of populations is to understand the respective core problems in their specific context. Technical approaches to solutions must be in synergy with the cultural, social and economic realities of the people themselves. Clearly, the problems of urban dwellers and nomadic pastoralists are often very different.

The relative importance of the 21 core problems in the two contexts is shown in Table 2.

## 4.5 Research status and focus

Research in IP4 is being carried out by two research networks. One will concentrate on studies in urban settings, which will primarily be carried out in the cities of Abidjan, Ouagadougou, N'Djaména and Nouakchott. Core problems surrounding nomadic populations in semi-arid regions will mainly be tackled in Chad, with links to Mali and Mauritania (Fig. 9). Table 3 shows details of the institutions concerned, their responsibilities and special areas of expertise, and the project leaders. While IP4 will form the core of the work of the NCCR in West Africa, complementary research activities and assistance will involve members of other IPs, particularly the participation of IP3, IP5, IP6 and IP8.

After the core problems for research had been established, a list of priority research themes was established during the workshop in Abidjan. Table 4 presents these, and ranks them according to their importance for people in the two contexts. Each research theme tackles several core problems, and the research activities always consider the social, economic and political background. This section summarises research activities in the two contexts, as well as aspects that are important in both contexts. Results are being reported in detail in the scientific literature and will also be made available on the NCCR web site.

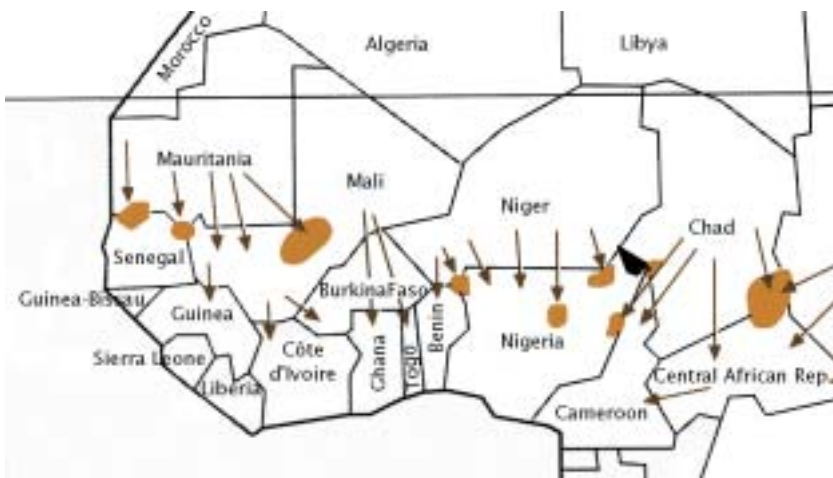


Fig. 9  
Routes of migration  
of nomadic  
pastoralists.

Source:  
Akakpo, 1994



Table 3

IP4 research network on urbanisation and nomadic populations.

Country	Institution	Task / responsibilities	Disciplines	Name
Côte d'Ivoire	CSRS	JACS centre West Africa. Design and supervision of studies on urban environment in Abidjan. Design and supervision of studies on urban health in Abidjan.	Biomedical and social sciences, civil engineering	Cissé G.
Chad	CSSI	Design and supervision of clinical field studies and HIV/AIDS in N'Djaména	Medical responsibility	Daugla D.M.
		Design and supervision of studies on urban poor, intervention strategies and geographical studies	Geography and sociology	Ndjékor Y. Nodjiadjim A.
	LRVZ	Microbiological laboratory (tuberculosis, anthrax etc.)	Microbiology	Diguimbaye C. Maho A.
Mauritania	CNH UNICEF	Socio-cultural studies, RAF and impact assessment	Sociology	Arsène A. Lemlih O.B.
	OMS	Design and supervision of health impact studies and clinical field studies	Biomedical sciences, medical responsibility	Benzerroug E-H.
	CNH	Sociological studies	Sociology	Ould Taleb M.
Burkina Faso	EIER	GIS for town planning	Geography, modelling	Kientga M.
	CREPA	RAF for environmental management at ward level	Sociology and civil engineering	Guène M.
Mali	LCV	Design and supervision of zoonoses studies. Comparative studies with Mauritania and links with Institut du Sahel	Animal health systems	Bonfoh B.
Switzerland (part 1)	STI	IP4: General management and coordination	Epidemiology and health systems	Tanner M.
		Design and coordination of studies on urbanisation and health systems	Health systems	Wyss K.
		Studies on medical anthropology and cultural epidemiology	Anthropology	Obrist B.

Table 3  
(continued)

Country	Institution	Task / responsibilities	Disciplines	Name
Switzerland (part 2)	STI	Coordination, design of studies on nomadic people	Veterinary epidemiology	Zinsstag J. Schelling E.
		Mathematical models, predictive modelling and GIS	Biometry	Vounatsou P.
		Economic appraisal and inputs into all studies	Health economy	Hutton G.
		Molecular epidemiology	Molecular biology	Beck H.P.
	IP3	Urban agriculture, status, risks, economics	Civil engineering, economics	Schertenleib R.
	IP5	Urban social dynamics, urban observatories in Senegal and Burkina Faso	Sociology	Bolay J-C.
	IP6	Anthropology and livelihood analysis in northern Cameroon	Anthropology	Haller T.
	IP7	Contribution to conflict resolution in Côte d'Ivoire	Conflict research	Ludi E.
		Comparative analysis of health as outcome in conflict and post-conflict situations		Debele B.
	IP8	Governance, decentralisation	Political sciences	Milbert I.
Univ. Berne	Zoonotic diseases		Microbiology	Frey J. Boerlin P.
			Mycobacteria	Pfyffer G. Baggi F.
All sites	IP1	Contribution to crosscutting issues and global overviews with special reference to vulnerability and risk	Geography systems analyses	Wiesmann U. Cassel-Gintz M.

Table 4

JACS West Africa – Priority research themes.	No. Themes – These themes are broad headings that should serve as a basis to formulate the hypotheses and the related research questions – All themes discussed are listed and ranked for each syndrome context	Ranking of importance for syndrome context*	
		Urban	Semi-arid
	1 Analysis of the health risks within the process of urbanisation in relation to environmental changes, the production of waste, water and sanitation in under-serviced, poor areas	1	NA
	2 Dynamics and practices of land use and exploitation with regard to urban agriculture	2	NA
	3 Management of conflicts between the formal and informal sectors/ systems in relation to land use, housing, food/food production, health service provision and small-scale businesses	3	NA
	4 Social exclusion and mental health problems in relation to urbanisation	4	NA
	5 Health status and access to health services with special emphasis on the diseases of poverty (HIV/AIDS, TB, malaria) and zoonoses at the systems, population and molecular levels	5 (for HIV, malaria, TB)	1 (for zoonoses)
	6 Health systems' and socio-cultural determinants of an integrated approach to human and animal health	NA	1
	7 Urban agriculture: effective food production and its link to the reuse of (1) organic matters from solid waste and (2) wastewater, and the impact on the health and well-being of poor urban households and their dependent family members in rural areas	6	0
	8 Understanding the demographic and epidemiological transition by analysing lead conditions such as ARI, HIV/AIDS, malaria, mental health (and “koko” as a potential key indicator in Abidjan)	6	5
* Ranking based on a nominal group approach during the West African JACS Workshop, May 2001.	9 Analysis of determinants and feasible processes to create models of health care provision and health promotion with the active participation of the population; an interdisciplinary analysis	8	3
	10 Mapping of health and environmental risks, housing and service provision as a basis for predictions and surveillance	8	4
	11 Understanding the interrelations between different energy sources and the well-being of households, including risk of indoor air pollution and AIR	10	NA

#### 4.5.1 Urban health and well-being

Urbanisation entails major demographic, social, cultural and environmental transitions and changes that have a marked impact on the health of the populations concerned. There is a substantial body of evidence about the status, trends and determinants of urban health in many countries (reviewed in Tanner and Harpham, 1995), but there are still many unanswered questions about the frequency of major illnesses, especially among the poor and vulnerable.

Comparative longitudinal studies will provide more knowledge about the frequency and distribution dynamics of the most important health problems in cities like Abidjan, N'Djaména and Dakar, and estimates of the disease burden among low-income city-dwellers. This approach is being complemented by a comprehensive demographic and environmental follow-up. Additional anthropological and gender-sensitive studies among the study populations, emphasising health and disease perceptions and health-related decision-making, will contribute to a comprehensive understanding of relations between urbanisation, migration, health and well-being, including both physical and mental health.

Big cities have many different offers of health care. In looking at the utilisation of health care, the following questions arise: What are the elements that affect decisions about what to do when health problems arise, whom to consult, and where to go? How do these elements interact? What is the economic impact of the health and illness burden at the household/clan level for low-income city-dwellers? These questions are best examined through a combination of qualitative and quantitative techniques, examining patterns of use of health care for different types of illness.

Another approach is to establish and map the key risk factors for ill health, risk behaviour and risk groups among low-income city-dwellers, and to determine how they perceive health problems, health risks and priorities in relation to their actual health status (Fig. 10).

Fig. 10  
An example of risk  
mapping and a  
basis for model-  
ling predictions.  
Cumulative inci-  
dence of dog  
rabies (January to  
November 2001)  
in N'Djaména,  
Chad (corrected to  
the vaccination  
coverage).



#### 4.5.2 Health and well-being of pastoral nomadic populations

In Chad, nomadic pastoralists have been found to have a high perceived illness burden; nevertheless, they use health services very little (Daoud et al., 2000; Wiese and Tanner, 2000). Health is often not a high priority. Health status and health service provision and use in semi-arid areas in Mauritania are now being studied.

Health services need to be improved and adapted to current environmental conditions, considering the needs not only of nomadic communities but also those of the sedentary populations in the same area, whose health status is often not much better. Observed and perceived health status will be assessed and ranked for both groups, in a participatory process, to compare the two prevailing ways of life. Pilot projects for health services delivery, such as joint services covering animal and human health, or the promotion of the use of auxiliary personnel in the communities (midwives, “auxiliaires de santé”) will be further assessed (Schelling, 2002).

Interactions between sedentary and nomadic communities are limited, and pastoralists are often socially excluded. However, it is important to find out what interactions do exist, so that key points of contact between nomadic groups and the surrounding society can be identified. These could be entry points for improvements in education, communication and organisation.

Education is an important precondition for improving health, because reliable information about diseases and about methods to prevent and cure them is notoriously lacking in nomadic settings. Lack of information is also a problem for other sectors, and ways to educate children and adults need to be identified. A decentralised communication network will be set up to enable concerned parties to identify perceived needs and assist nomadic communities to decide on their own priority actions. This process will be followed up by action research methods to combine pilot implementation with performance assessments (Habicht et al., 1999).

### **4.5.3 Health service provision**

Another theme common to both contexts is the need for the sustainable provision of adequate health care. Mounting evidence that in most low-income countries scarce resources were being used inefficiently, access to health services was poor, and services in general did not respond to the needs of the people (Berman, 1995; Bossart, 1998; Cassels, 1995) triggered off many processes of “Health Sector Reform”, which include a wide range of prescriptive transformations (World Bank, 1993, 1994; Frenk, 1994; Mills and Ranson, 2001; WHO, 2000). In Central and West Africa new organisational and financing mechanisms – such as user fees – have been introduced. There is mounting evidence that user fees without improvement in quality lead to a decrease in health service utilisation, often disproportionately affecting the poor (Haddad and Fournier, 1995). Various innovative strategies involving micro insurance schemes and social insurance are being tried to promote improved access to health services (Criel, 1998; Davies and Carrin, 2001). These strategies and others, such as participatory Research–Action–Capacity Building (i.e., Recherche–Action–Formation or RAF; Odermatt et al., 1999; Wyss et al., 2000), need to be tested and validated. An important question that is also being explored is the role and importance of human resources within reform processes (Mills and Ranson, 2001).

### **4.5.4 Assessment of risk and vulnerability**

A theme important in both contexts is extending the “risk” concept of traditional epidemiology to include the assessment of vulnerability. The concept of risk is the traditional approach to defining and measuring determinants of diseases and conditions, or identifying those most in need of interventions. Risk factors can be described, then measured by analytical epidemiological approaches and thus quantified. Risk assessments, combined with economic

considerations, form the basis for evidence-based planning of health interventions. However, the risk concept has limitations. It can be used to identify determinants of disease transmission and impact, but it does not enable risk factors to be seen in context. Risk assessments based on whole populations provide little understanding of variability, for example within and between households. Even well-planned interventions may face problems of compliance if they are designed without including the view of the beneficiaries, and risk assessments do not provide information about the potential of the local population to suggest and implement solutions.

The concept of vulnerability can provide a valuable complement to the risk approach. The traditional concept of defining and assessing vulnerability has been extended by the STI for application in development strategies and as a powerful tool to reconcile three factors: exposure to risks, capacity (social capital, entitlement) and potential (individual solutions/contributions).

The extended concept of vulnerability can accommodate the perspectives of social science and epidemiology in order to develop strategies to diagnose poverty and to develop ways to alleviate it (Tanner and Mtasiwa, in press). Research in the two different contexts of IP4 will allow the validation of the extended concept of vulnerability and comparison with the traditional risk approach of epidemiology and social sciences, which will provide a valuable framework not only for the definition of terms used in this project (CP 11), but for future work concerned with improving the health and well-being of vulnerable populations.

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## 5 JACS East Africa Searching for Endogenous Solutions to Sustainable Development in a Challenging Environment

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Fig. 1  
Nanyuki, an important centre within the highland-lowland system of Mt. Kenya.  
Photo: Urs Wiesmann, 2002



\* On behalf of all the participants of the workshop held in Nanyuki, Kenya, 28-30 May, 2001  
(listed in Annex 1, p. 445)



## **Abstract**

Kenya, Uganda and Tanzania are the countries covered by the JACS East Africa. These three countries share a similar political history as well as similar socio-economic, cultural and ecological characteristics, and face common development challenges related to environmental and economic issues.

Kenya, Uganda and Tanzania attained independence from Britain in 1961, 1962 and 1963 respectively, although Tanzania had been under German rule before 1918. All three countries have great cultural and ethnic diversity, embedded in the practices of multi-tribal societies. Whereas Kenya and Tanzania are now young multi-party democracies after three decades of single-party statesmanship, Uganda still remains with a single-party system. The rate of population growth in all three countries has declined markedly in the last few years. A large proportion of the population is still rural and predominantly agro-pastoral. Large parts of the region are arid and semi-arid. Explosive population pressure in the high-potential areas has resulted in massive waves of migration into the neighbouring low-potential, semi-arid lands, causing unprecedented pressure on the already fragile environment. The ensuing land use practices and farming systems are incompatible with prevailing ecological conditions, and options for diversification are limited by the lack of local innovative capacities and government failure to promote the right strategies. Coupled with the problem of recurrent severe droughts and intense competition for scarce natural resources, these factors make East Africa one of the world's most challenging environments – characterised by severe land degradation and declining productivity, growing conflicts over resource use, the prevalence of poverty and insecure livelihoods, as well as increasing social and economic dependence. Most government and non-governmental programmes have failed to address these problems. Hence endogenous solutions must now be sought. IPI, together with other collaborating IPs, is assessing and promoting utilisation of the endogenous potential for sustainable development in this region.

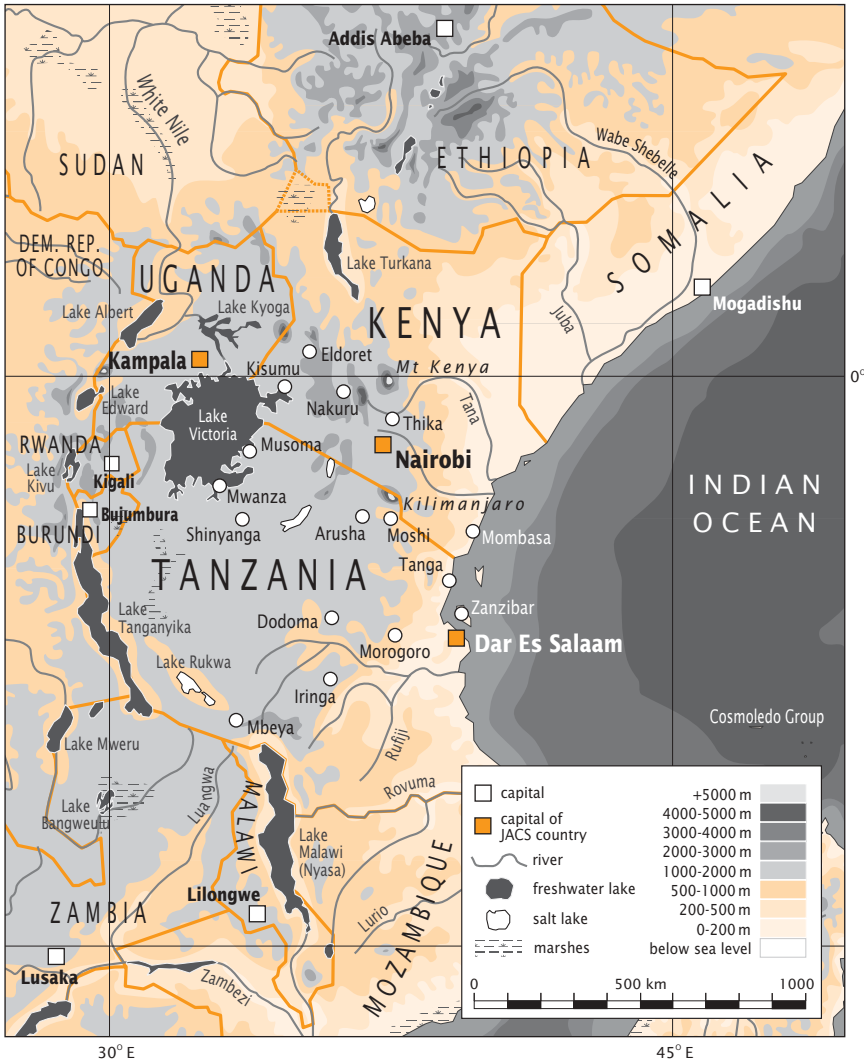


Fig. 2: JACS East Africa. Kenya, Tanzania and Uganda, three countries in what has traditionally comprised the East Africa region, not only share a common past under British colonial rule, but also have similar regional ecological characteristics and key natural resources, such as freshwater, wildlife habitats and major landforms.

## **5.1 Introduction to the JACS East Africa region**

The region known as East Africa has traditionally been comprised of Kenya, Tanzania and Uganda. These three countries came into existence in their present form between 1890 and 1910, as a result of the colonisation process in Africa. They attained independence from Britain in 1961, 1962 and 1963 respectively. Hence they have a similar political history and a heritage of British colonial rule, although Tanzania was under German rule before 1918.

The three countries also share similar local and regional ecological characteristics, as well as key natural resources such as freshwater lakes (Lake Victoria) and rivers, wildlife habitats and major landforms. Among these resources, Mt. Kilimanjaro and the Mara/Serengeti savannah grassland, with its wildlife and tourism potential, are shared by Kenya and Tanzania.

There are also many ethnic groups distributed throughout the region who share an indigenous social and cultural heritage. The present JACS East Africa report will focus on Kenya and Tanzania only. Key data on the two countries and on Uganda are presented statistically in Table 1.

Table 1

	Year	Kenya	Tanzania	Uganda
<b>Geography and social indicators</b>				
Surface (thousand sq. km)	2000	580	945	241
Total population (million)	2000	30.7	35.1	23.3
Annual population growth rate (%)	1990–2000	2.4	2.8	3
Urban population (% of total population)	2000	33	28	–
Annual urban growth rate (%)	1990–1995	6.2	6.5	5.6
<b>Development and economic indicators</b>				
GDP per capita, at purchasing power parities (USD)	2000	1,022	523	1,208
HDI rank (total 173)	2002	134	151	150
Human Poverty Index (% of population below poverty line)	1989–2000	42	51.1	35.2
Population in agriculture male / female (% of labour force)	1998–2000	20/ 16	–	–
Public expenditure on education / health (% of total public expenditure)	1995–1997/ 1998	6.5/ 2.4	–/ 1.3	2.6/ 1.9
Population with access to safe water / adequate sanitation (%)	2000	49/ 86	54/ 90	50/ 75
<b>Environmental indicators</b>				
Crop land per capita (hectares)	1997–1999	0.14	0.12	0.24
Area of severe soil degradation (% of country)	2000	30	25	53
Protected area (% of total surface)	1999	6.2	15.6	9.6
Energy consumption per capita (kilogram of oil equivalent)	1999	499	457	–

Some key indicators for the countries in the JACS East Africa.

Sources:  
UNDP, 2002;  
World Bank,  
2002a+b;  
FAO, 2000

## 5.2 Selection and explanation of core problems

### 5.2.1 Definition of syndrome contexts

In the case of the JACS East Africa, the three broad syndrome contexts were elaborated in order to reflect geographical diversity. This resulted in the following seven area-specific contexts:

- Urban and peri-urban areas:** (1) Urban and peri-urban areas (large and medium-size cities).
- Semi-arid areas in transition:** (2) Semi-arid areas with mixed use, irrigation and great economic and political disparities.
- (3) Semi-arid areas with encroaching agro-pastoralism practiced by marginalised smallholders.
- (4) Semi-arid areas with predominantly pastoralist use in the economic and political periphery.
- (5) Semi-arid areas that include protected areas and their surroundings.
- Highland-lowland areas:** (6) Mountains and highlands with a broad range of conflicting uses and stakeholders.
- (7) Areas of interaction between mainly productive highlands and semi-arid lowlands.

#### *Urban and peri-urban areas*

The urban and peri-urban syndrome context includes the large cities and medium-size towns in the JACS East Africa. These are areas that exhibit similar clusters of core problems relating to sustainability. In Kenya, they include cities like Nairobi, Mombasa and Kisumu, and medium-size towns such as Nakuru, Eldoret and Thika. In Tanzania the cities include Dar es Salaam and Mwanza, while the medium-size towns are Arusha, Moshi, Morogoro, Mbeya, Dodoma, Musoma, Iringa, Shinyanga and Tanga. The rest are considered rural towns and trading centres, and are included in relevant syndrome contexts.

*Semi-arid areas with mixed use and irrigation, and agro-pastoral areas*

The semi-arid areas with mixed rainfed and irrigation agriculture in the two countries cover approximately 25% (43% of which is in Kenya) of the total land area of about 1,527,746 km<sup>2</sup>. Despite their semi-arid characteristics, these areas are endowed with water resources, especially wetlands and river water traversing from the neighbouring highlands that allow for some irrigation. Otherwise, they are largely agro-pastoral. The areas include Dodoma, Singida, North Iringa and some parts of Arusha and Shinyanga in central Tanzania, and Morogoro (except Kilombero, Wami Basin and Ulugulu Mountains), Lindi and SW Mtwara in southern Tanzania. The Kenyan portions include districts in the south: Kajiado, Narok and Transmara. In the north and central rift valley the districts are Laikipia, Baringo, parts of Samburu, parts of Marakwet and West Pokot, and in the east parts of north and central Meru, Tharaka, Mbeere, Mwingi, Kitui, Machakos and Makueni. The entire coast is also included, except Tana River district, and some small parts of central Kenya.

*Semi-arid, pastoral protected areas and forest areas*

The semi-arid pastoral and protected areas, such as national parks and forest areas, are largely dominated by pastoral communities and used almost exclusively for livestock herding. In Tanzania, these areas include the northern and north-eastern plains, encompassing the Maswa Game Reserve, Mkomazi Game Reserve, Serengeti National Park and other dry Maasai plains in the north. The Kenyan parts include portions of Laikipia, Baringo, Nakuru, Kajiado, Narok, Transmara, Samburu, Meru North, Makueni, Mwingi, Marakwet and West Pokot. Other districts included are Marsabit, Isiolo and Turkana.

*Highland areas (mountains and highland-lowland interactions)*

The Mt. Kenya and Mt. Kilimanjaro regions are typical examples of highland-lowland systems, with resource-rich highland areas surrounded by vast resource-poor lowlands. Other mountains and highlands include the Aberdare ranges in central Kenya, and Mt. Elgon in western Kenya bordering Uganda. In Tanzania, these areas include Mt. Meru, the Eastern Arc Mountains and the Southern Highlands in Tanzania and their adjacent lowlands.

### 5.2.2 Selection of core problems

Based on these 7 syndrome contexts, a total of 34 core problems were defined and assigned to the 5 major scientific realms, which include political and institutional issues, socio-cultural and economic issues, population and livelihood issues, infrastructure and land use issues and bio-physical and ecological issues. These are presented in Table 2.

Table 2

Core problems and  
scientific realms.

Realms	Core Problems (CP)
Political & institutional	1. Conflicts, instability, lack of capacity and co-ordination among formal institutions
	2. Erosion and weakening of community-based and traditional institutions
	3. Inadequate and conflicting policies coupled with lack of implementation
	4. Insufficient grassroots and institutional empowerment, failures of governance
	5. Corruption and obstructive power structures
	6. Inequitable and inadequate allocation of power and resources
	7. Dominating and conflicting world views and ethical values
Socio-cultural & economic	8. Social and ethnic tensions
	9. Violent conflicts
	10. Great socio-economic and gender disparities
	11. Unused innovative capacities, knowledge and skills
	12. Incompatible and fragile economic systems with limited market and employment opportunities
	13. Dominance of the global economy over national economies
	14. Limited and inadequate essential social services and facilities
	15. Development constraints resulting from cultural norms and practices
Population & livelihoods	16. Rapid population growth, pressure and migration
	17. Increasing social and economic dependence
	18. High risks and vulnerability to disease (AIDS, epidemics, emerging diseases)
	19. Prevalence of poverty and insecurity of livelihoods
	20. Insecurity and rising crime rates (banditry, poaching)
	21. Violation of human rights and constraints on individual development potential

Realms	Core Problems (CP)
Infrastructure & land use	22. Inadequate sewage, sanitation and solid waste management
	23. Inadequate water supply systems and management
	24. Inadequate and insufficient infrastructure
	25. Rapid and haphazard physical growth and expansion of cities and settlements
	26. Inequitable access to suitable and adequate land
	27. Non-optimal productivity levels and inappropriate land use systems
	28. Conflicts of interest and use of protected areas
	Bio-physical & ecological
30. Land degradation	
31. Loss of biological diversity	
32. Environmental pollution	
33. Risks of natural and human-induced hazards and climate change	
34. Overuse of renewable and non-renewable natural resources	

### 5.2.3 Explanation of the main core problems

Not all 34 core problems defined by the JACS East Africa research activities carry the same weight in terms of magnitude in the different scientific realms. Thus in order to identify the main problems among these 34, the following criterion was used: all core problems with a score of 5–7 in at least 6 of the 7 syndrome contexts were considered major. In addition, core problems with a score of 7 in any of the syndrome contexts, even if in less than 6 cases, were also considered major. Using this criterion, a total of 9 main core problems were identified. These problems are elaborated below.

#### *1. Conflicts, instability, lack of capacity and co-ordination among formal institutions*

This core problem falls under the political and institutional realm. Rapid population growth in both rural and urban areas has placed insurmountable pressure on existing resources and facilities. Competition for available resources and services results in conflicts among users and in ethnic and cultural tensions that threaten social and political stability in the areas affected. Efforts to address these conflicts have been compromised by lack of institutional capacities to formulate and co-ordinate the implementation of effective resolution mechanisms. This calls for stepped-up resources to support mitigation research in this area.



### *2. Incompatible and fragile economic systems with limited market and employment opportunities*

Internally, people eligible for employment but not formally employed have resorted to self-employment in the informal job market, albeit with low-quality products and services, owing to lack of technological support and a culture of innovation. At the same time, employment opportunities are depressed because the urban economy lacks strategies on spatial policy that link changes in population distribution and structure with internal factors that influence urbanisation and location of employment centres in towns. For these reasons, urban systems are dominated by incompatible and fragile urban economic activities, aggravating an already severe urban poverty situation.

### *3. Prevalence of poverty and insecurity of livelihoods*

The problems of poverty and insecure livelihoods have become prevalent in both rural and urban environments, and are increasing rapidly. The proportion of Kenyans (in both rural and urban areas) living below the poverty line in 1997 was 52.6%, as against 1994, when the figure was 40.1% overall. In rural areas 53.1% of the population are poor. Poverty in urban areas has increased significantly, by 20.3%. Although poverty has always been considered a rural phenomenon, it is now obviously prevalent in urban areas as well (GoK, 2000a). Rural areas continue to depend on agricultural production systems that are subject to the vagaries of weather. The urban poor, on the other hand, engage in the so-called informal trade, where the market is characterised by previously biased demand and the operating environment is generally not enabling. The situation in Tanzania is no better. Thus there is a need to continue supporting research in this area in order to identify effective ways of mitigating problems in both rural and urban areas.

### *4. Inequitable access to suitable and adequate land*

The issue of equitable distribution of productive land has featured prominently in debates on land reform in Kenya over the years. The current framework of land policy and legislation provides, among other things, for private ownership of land, with exclusive rights of ownership and use reserved for individuals or corporate entities. This makes for very inequitable access to land. Scarcity of land has also led to the problem of landlessness in some areas, especially those adjacent to protected areas such as national parks. The main question, therefore, is how to institute appropriate reform measures to ensure land redistribution in order to address the problems associated with inequitable access to suitable and adequate land. This applies as well to

Tanzania. Research that contributes to solutions to this problem will be a step in the right direction.

#### *5. Conflicts of interest and use of protected areas*

Past management practices and the corresponding policy and legislative framework for protected areas in East Africa alienated communities from the use of resources in these areas, resulting in conflicts between these communities and the authorities. Similarly, the nature of use in the adjacent areas (mainly agricultural) conflicted with use in areas where wildlife was protected, especially where agricultural land falls within the main dispersal corridors. However, this trend has been changing over time, and community-based conservation initiatives have emerged. Yet even after more than a decade of implementation of such initiatives, many have failed to incorporate local communities into the management systems, largely because of problems stemming from weaknesses in project design and implementation. Hence there is a need to support further research in these areas in order to help formulate better project designs and propose workable implementation approaches.

#### *6. Inadequate sewage, sanitation and solid waste management*

The 7 syndrome contexts are characterised by inadequate and malfunctioning sewage and sanitation facilities, not to mention the absence of effective solid waste management systems. As a matter of fact, in semi-arid pastoral areas, such facilities are lacking altogether. In urban areas, increased incidences of frequent flooding, inability to manage urban solid waste and the widespread lack of effective sewage systems have made health problems worse. Thus the significance of these facilities in terms of health cannot be overemphasised. This is a reason for continued mitigation research.

#### *7. Inadequate water supply systems and management*

The goal of the Kenyan government to supply water to every household in rural areas has remained a dream since it was stated at the beginning of the 1970s (see also various government policy documents and National Development Plans). Instead, the past decades have witnessed increasing deterioration of existing water supply systems, owing to vandalism and poor management. As a result of growing demand for more owing to population increase, already dilapidated supply systems have been rendered inadequate. Given limited water resources, especially in semi-arid areas, the available options for exploiting untapped potential, especially in rainwater

harvesting, need to be aggressively explored. Strategies to divert the ever-growing demand for irrigation water are also necessary (Kiteme et al., 1998; Wiesmann, 1998; Wiesmann and Kiteme, 1998). Overall water supply management approaches must be reviewed in order to help improve the current situation. Research to support these initiatives is imperative.

#### *8. Loss of biological diversity*

Continued heavy disturbance of areas in Kenya and Tanzania known for great biological diversity, through poaching/hunting and encroachment for incompatible uses such as agriculture, logging and other human activities, have led to loss of biodiversity of both flora and fauna. For example, recent studies have shown that some important wood species such as *Ocotea usambarensis*, *Juniperus procera*, *Podocarpus* spp. and *Olea* spp. are particularly threatened on Mt. Kilimanjaro and Mt. Kenya (Emerton, 1995). Animal species are also affected, as revealed in a survey done by Milner (1993), which was unable to trace any Bushbuck (*Tragelaphus scriptus*) in the Embu-Kirinyaga region, suggesting that they may have been hunted to extinction owing to the attractive prices they command.

Similar trends in loss of biological diversity have been reported in semi-arid areas in transition, especially in protected areas and other areas that are well endowed with natural resources. Concerted efforts will be required to reverse these worrying trends, and research in these areas could make a significant contribution towards achieving the desired outcomes.

#### *9. Overuse of renewable and non-renewable natural resources*

There is increasing concern about the adequacy of the natural resource base of countries in East Africa. This concern stems from the increasing overuse of both renewable (forestry, fisheries, related water systems and agriculture) and non-renewable (minerals) resources, triggered by the growing demand for local, national and export markets, as well as escalating competition for control by different user groups. Recent developments such as the policy shift in Tanzania, whereby foreign companies were invited to invest in the mineral mining sector (e.g. gold), are likely to aggravate the situation if not well implemented. Hence there is a need for continued research in this area to provide information on appropriate policy intervention to address the associated problems.

## 5.3 Status and dynamics of core problems

### 5.3.1 Urban and peri-urban areas

#### *Political and institutional issues*

The core problem in the urban and peri-urban context in this realm is the lack of a comprehensive urban land use policy and a complete absence of political will on the part of the government to formulate and implement such a policy. Secondly, both the local and central governments lack the capacity to facilitate planning and influence management of development and transformation. Inter and intra-institutional relations are weak as a result of competing rather than complementary power relations, occasioning institutional inertia in terms of political accountability.

Because of poor urban governance, civil society institutions and individuals are excluded from decision-making processes. Furthermore, the municipal authorities are denied the requisite scope to formulate and implement legitimate planning and management policies dealing with resources. Problems of governance at the national level have become entrenched by forms of political organisation that make political office dependent on ethnic and personal considerations (Balogun, 1998). This stifles civil culture by personifying state power and local institutions, and has resulted in serious conflicts involving central and municipal governance.

Urban planning and development practices in East Africa have long been based on improper land use planning policy and characterised by a lack of urban development policies. The Strategic Structure Plan (SSP) for Nakuru (Kenya) in 1998, and the Strategic Urban Planning Framework (SUPF) for Dar es Salaam (Tanzania) in 1999, are the most recent attempts by the respective governments to revise urban planning and development policies in the urban areas concerned. Furthermore, these were prepared as part of the two countries' participation in the implementation of the Habitat II Agenda in East Africa (Mwangi, 1997; Dar es Salaam City Council, 1999). Prior to this initiative both cities had relied on plans prepared in the 1970s.

These political problems have ultimately suppressed the requisite ethics for sustainable urban planning and development. Formal and informal actors continue to unduly influence the process of physical organisation and local economic development through the least transparent administrative decisions in land allocation, piecemeal urban land subdivision schemes in public

and freehold land, and corrupt practices of enforcing land use and development requirements.

#### *Socio-cultural and economic issues*

Urban and peri-urban development issues are intricately linked to a dichotomy of issues relating to economic production and employment. There are no demonstrable municipal economic policies and programmes to enable economic partnerships among councils and investors that would create more employment opportunities (Peterson, 1994). Those eligible for employment but not formally employed have resorted to self-employment in the informal job market, albeit with low-quality products and services, owing to lack of technological support and a culture of innovation. At the same time, employment opportunities are depressed because the urban economy lacks strategies on spatial policy to link changes in population distribution and structure with internal factors influencing urbanisation and location of employment centres in towns. For these reasons, incompatible and fragile urban economic activities dominate urban systems and have made already severe urban poverty even worse.

#### *Population and livelihood issues*

Throughout the 1980s and 1990s the urban population in the two countries increased rapidly, greatly constraining social service delivery systems, especially in housing, health, education, recreation and supply of clean water. The rise in unemployment as a result of this high population growth (especially rural-urban drift) and retarded overall economic growth have in turn resulted in widespread poverty and extreme economic disparities among the people living in these urban areas. As the effects of poverty bite deep, illicit strategies, adopted as coping mechanisms, become manifest among the affected groups in the form of severe problems of insecurity and a rise in crime rates. The result is a near total breakdown of formal and indigenous social and support networks. Community policing initiatives have not been fully established, while the high level of unemployment has reduced the productivity of urban social systems. This is evident in increasing numbers of street dwellers (children, beggars and the mentally retarded), single mothers and homeless persons. These outcomes contradict the essence of the Habitat Agenda and commitments to poverty reduction and unemployment (Okpala, 1996). Following the withdrawal of national public health care services, and given the lack of a strong private sector to manage health care, most people in urban and rural areas have very limited access to curative and preventive health facilities and services and health information, and live in poorly con-

structed structures without proper ventilation and sanitation facilities. Increased incidences of frequent flooding, inability to manage urban solid waste and a widespread lack of effective sewage systems have aggravated urban environmental health problems (Lee-Smith, 1989). More than ever before, the urban population is thus continually exposed to high risks and vulnerable to disease.

#### *Infrastructure and land use issues*

The main infrastructure and land use problems are associated with haphazard decisions taken by the government to expand municipal council boundaries and elevate lower level councils to higher levels, without a corresponding increase in funding for development of infrastructure and services such as solid waste management, water supply, drainage and roads, and mortuaries. Most of these are either inadequate or poorly maintained and therefore not operational. This has created unplanned, indefinite limits in peri-urban areas (Kulaba, 1989), occasioning serious land use conflicts. Other associated problems include inadequate distribution and provision of other essential utilities such as recreational and burial sites.



Fig. 3  
 Peri-urban growth around Nairobi, posing major challenges for planning and for the development of infrastructure, services and communities.  
 Photo: Urs Wiesmann, 2001

*Bio-physical and ecological issues*

Poorly planned and unplanned urban development further underscores the increased incidence of environmental pollution in the forms of air, water, soil and noise pollution. Major parts of urban areas are without reticulated sanitation, have poor drainage and lack functioning solid waste disposal mechanisms to cope with unusually high-density urban settlements. While poor urban drainage systems lead to frequent flooding, poor urban solid waste management causes serious water pollution, especially during floods. Urban wetlands are especially heavily polluted (Fig. 3) because they are often seen as repositories for waste disposal.

Improper planning and inadequate land allocation in urban areas are also responsible for the disappearance of urban wetlands and loss of biodiversity. In recent years the Msimbazi Wetland in Dar es Salaam has rapidly changed from a natural habitat to a settled industrial and agricultural area.

**5.3.2 Semi-arid areas, mixed use and irrigation, and agro-pastoral areas**

*Political and institutional issues*

The arid and semi-arid lands (ASALs) have continued to deteriorate in terms of overall economic development, despite deliberate efforts to introduce appropriate sector-oriented policy interventions. This is largely because the present policy and institutional framework for development of these areas is still overcrowded, to the extent that most programmes are implemented against a backdrop of unco-ordinated and conflicting policies. Furthermore, frequent reformulation and reshuffling of the institutions responsible, coupled with inadequate capacity and high turnover of professional and technical staff, have made efficient and effective implementation of these policy instruments a daunting task.

Participation by local communities in development has remained passive and inactive, due to poor empowerment: these communities are characteristically poor, with low literacy levels and below-average income. They are engaged in naturally marginalised and insecure livelihood systems and are therefore highly vulnerable to famine and political manipulation as they struggle to survive.

*Socio-cultural and economic issues*

Competition for scarce resources due to rapidly growing populations and the resultant high demand in semi-arid areas has in turn resulted in intensified resource use conflicts, especially conflicts related to water scarcity, particularly during the prolonged dry season in these areas. Resource conflicts more often than not awaken latent conflicts, which tend to remain dormant as long as all is well. In most cases these resource use conflicts take the form of social and ethnic conflicts (Kiteme and Gikonyo, 2002).

In areas where large-scale irrigation is practised, e.g. for rice, with a labour force comprised of people from different ethnic backgrounds, breakdown of social norms has been on the increase.

Communities in semi-arid areas are also characterised by socio-cultural practices and political and institutional structures that promote gender and socio-economic disparities between different social strata. These are manifested in terms of disparities in income and access to income, access to and control of resources (especially land and livestock), and discriminatory decision-making and resource-sharing processes especially disadvantageous to women.

*Population and livelihood issues*

Communities in the semi-arid areas depend largely on marginalised and insecure livelihood systems. Subsistence crop production constitutes the primary source of livelihood. In areas where irrigation agriculture is possible, fruit cultivation and horticulture focus mainly on local trading centres. Livestock constitutes the secondary source of livelihood; the main types are local breeds of shoats, cattle and donkeys. In the northern and eastern semi-arid areas of Kenya, livestock production is threatened by high rates of cattle rustling. These activities are very vulnerable to drought, which means that food deficits are virtually permanent. Consequently, communities in these areas are characteristically poor, as manifested by low levels of income, malnutrition, poor health and lack of access to essential social services and infrastructure. Most of the coping mechanisms, such as small-scale trade and bee keeping, are subject to the performance of farming activities, or are illicit (charcoal burning) because they contribute to environmental degradation. In this situation, communities have become highly (and almost perpetually) dependent on external relief – indeed there is a marked culture of dependency here.





Fig. 4  
Recurrent poor  
crop performance  
in marginal areas  
has compromised  
local efforts to  
enhance food  
security.

Photo: Urs

Wiesmann, 1992

In areas where irrigation schemes have been established and livelihood systems greatly enhanced, there has been a marked increase in transmission of infectious diseases such as diarrhoea, dysentery, cholera, typhoid, skin and eye diseases, filariasis and dengue fever, among others. Furthermore, many government-established irrigation schemes are riddled with major land use conflicts resulting from displacement of people and their traditional land use systems.

#### *Infrastructure and land use issues*

Physical infrastructure (water supply systems, communication and sanitation facilities) in the semi-arid areas of East Africa is in a largely deplorable condition. To date, use of unsafe sanitation (pan/bucket, uncovered pit latrine and bush) or lack of it (20% of the households) in the ASALs is still rampant (GoK, 2000b, 2000c). Furthermore, urban sanitation systems (flushing toilets) are, in many rural towns and centres, real health hazards due to inadequate water supply. Similarly, the available water storage and supply systems are not adequate to satisfy current demand for water in these



Figs. 5 and 6  
The problem of  
water scarcity:  
Exploring the rain-  
water harvesting  
options of rock  
catchments and  
subsurface dams.

Photos:  
Urs Wiesmann,  
1992,  
Hanspeter Liniger,  
1993

areas, either for domestic purposes or livestock, let alone for irrigation. There is a need to develop the infrastructure to address these problems, especially poor delivery of water for domestic use.

#### *Bio-physical and ecological issues*

Prevailing rainfall characteristics are largely responsible for the moisture deficit conditions in semi-arid areas. This makes rainfed agriculture difficult, leading to frequent crop failure and recurrent famines. Inadequate and unreliable rainfall also implies inadequate availability of water resources. Therefore, communities in these areas depend largely on shallow wells in the dry riverbeds and subsurface dams for the better part of the year. The potential for groundwater utilisation is limited by the high costs of drilling and maintenance, and by water quality and quantity.

The problem of land degradation has reached alarming proportions in semi-arid areas. Population growth has resulted in high rates of devegetation, as more land is cleared for settlement and cultivation. Loss of vegetation cover as a result of ensuing land use changes exposes the soils to the agents of erosion. Land degradation is also evident in the semi-arid areas where irrigation agriculture has long been practised, especially where water with high salinity levels is used, coupled with use of inefficient drainage reticulation systems. Moreover, prolonged use of agro-chemicals in irrigation schemes has resulted in serious chemical pollution affecting soil and water in the irrigated areas.

### **5.3.3 Semi-arid pastoral areas, protected areas and forested areas**

#### *Political and institutional issues*

Until the 1990s, semi-arid pastoral areas suffered from insufficient state funding because they were considered 'unsuitable and unable' to contribute meaningfully to national economic development. The effects of these prejudicial tendencies by the authorities continue today in the form of policies inadequate to guide development activities and lack of empowerment of local communities, which would allow them to participate effectively in decision-making processes. However, this has changed over the years, and laudable efforts by the government and other development agents have now been made in programmes initiated to support development activities in these areas, albeit with the problem of lack of horizontal and vertical coordination among and between implementing institutions. The net results are duplication of effort and creation of undesired impacts.



Domestic tourism is grossly underdeveloped, largely owing to lack of policies to promote it. This has greatly restricted the participation by most local residents to entertaining foreign tourists and producing curios in the form of carvings for sale to visitors.

*Socio-cultural and economic issues*

Semi-arid pastoral areas are characterised by limited economic options. The leading economic enterprise, livestock production, is below optimum level due to lack of access to livestock markets and related infrastructure, among other serious problems such as disease and drought. In cases where commu-

Fig. 7  
Heavily degraded  
lands in Muko-  
godo, Laikipia,  
Kenya. Photo:  
Urs Wiesmann,  
2003

nities are able to generate good livestock proceeds, they are imprudently utilised owing to lack of alternative opportunities for re-investment.

Facilities to cater for provision of education and health services in these areas have remained largely inadequate and in some areas quite inaccessible. Therefore, education and health standards in these areas are still very poor, as reflected in high mortality rates, the high incidence of disease (25 %), low secondary school enrolment rates (19%), and high adult illiteracy rates (30%) (GoK, 2001). Consequently, a large proportion of the active labour force is highly unproductive because of poor health and low levels of education. This leads to low levels of individual empowerment, participation and development, and an inability to realise the full personal potential to gain maximum benefits from available opportunities. These factors combine to greatly limit individual and societal innovative capacities. Furthermore, communities in these areas have remained largely tied to their tradition-bound cultural practices, which are gender-discriminative and therefore impact negatively on sustainable resource use and management in these areas. The desire to involve local communities in the conservation of protected areas has been stepped up in the recent past against the backdrop of resources inadequate to police and manage these areas. There are, however, serious challenges arising from the inequitable manner in which the costs and benefits of conservation are currently shared. The conservation authorities continue to reap disproportionately huge benefits at the expense of the local communities.

#### *Population and livelihood issues*

The problem of inadequate water supply in semi-arid areas with mixed agro-pastoral activities and irrigation agriculture has been elaborated elsewhere in the present report. The situation is much worse in semi-arid pastoral areas. Watering facilities become concentration points for human settlement and associated land use systems, leading to localised population pressure and resulting land degradation.

Health problems associated with the lack of safe sanitation, especially in human waste disposal, are very evident. A high percentage of pastoral communities dispose of human waste in open bushes in the backyard of their *manyattas*. This waste becomes a major contaminant in run-off water that collects at various public consumption points once the rains come, and leads to serious outbreaks of water-borne diseases.

Poverty is another serious problem facing the communities living in semi-arid pastoral areas. It is indeed the cause, as well as the effect, of marginalised and insecure livelihood systems in these areas. Pastoralists depend largely on livestock production, which is subject to adverse weather and problems of insecurity such as banditry and cattle rustling. Poverty also fosters a mentality of dependence, sometimes resulting in misdirected priorities, thereby increasing great vulnerability to drought and famine. Poaching, although not so pronounced, is also experienced in isolated cases within the protected areas and presents a major security concern in the affected areas.



Fig. 8  
Livelihoods in marginal areas have to cope with the contrasts between local traditions and modern influences.  
Photo: Urs Wiesmann, 2003

#### *Infrastructure and land use issues*

Semi-arid pastoral areas are at times described as 'remote areas' to insinuate the general paucity of appropriate infrastructure. These areas are almost completely disconnected from other parts of the country. People walk long distances (10–15 km or more) on foot for services that are not even guaranteed. Donkeys and camels are the main means of transport for goods, young children and sick people.

In the midst of these poorly served areas are national parks and reserves, which are characterised by over-construction of tourist facilities, resulting in serious environmental pollution and degradation, especially in areas where disposal and rehabilitation initiatives do not exist.

Changing economic lifestyles and increasing population pressure in these areas have led to an increase in sedentary agriculture, bringing with it inappropriate land use practices such as crop production. There is encroachment on grazing and wildlife areas for agriculture, leading to pasture shortages. There is a gradual shift to agriculture as a coping strategy by pastoral communities. However, the marginal conditions in these areas cannot sustain agricultural production, resulting in low levels of productivity.

#### *Bio-physical and ecological issues*

The core problems identified in this realm include loss of biological diversity, lack of energy for consumption, soil degradation, lack of water, floods, fires and pollution due to military and mining activities, forest degradation and desertification.

### **5.3.4 Highland-lowland areas (mountains and highland-lowland interactions)**

#### *Political and institutional issues*

The existence of multiple stakeholder institutions supporting sector-based intervention programmes for management of mountain resources has resulted in the formulation of sector-specific policies and less stakeholder participation, leading to conflicts of interest. Even with these policies in place, implementation has been lacking due to poor co-ordination and insufficient financial and human resources. Lack of effective participation by local communities has greatly contributed to erosion and weakening of hitherto effective community-based and traditional institutions. This has resulted in great inefficiencies and inequitable distribution of costs and benefits. In response, local communities are compelled to over-exploit and degrade their environment. Corruption is another big problem that has accelerated the degradation of forest resources in the two countries.

#### *Socio-cultural and economic issues*

Despite the resource endowment of mountains and highland areas, marketing infrastructure is poorly developed. Post-harvest losses of perishable fruits and vegetables are high due to skewed production patterns unrelated to



patterns of demand. Employment opportunities are limited. Land shortage is constraining employment in the agricultural sector, which is the main economic base. Local communities are not allowed to obtain resources from protected areas except for fodder, which is obtained by permit. Thus most of the population, who are largely smallholders, are concentrated in the upper and middle parts of the catchments. These tenure arrangements have encouraged encroachment into the forests and introduction of illicit activities by communities in adjacent areas (Lambrechts et al., 2002; Gathaara, 1999). The result is conflict between these communities and the government authorities. Violent conflicts between farmers and pastoralists are common in the lowlands where, because of immigration from the highlands, pasture and water resources are constrained as grazing lands are converted to agricultural lands and demand for water for irrigation increases tremendously.

#### *Population and livelihood issues*

The high population densities in the mountains and highlands of East Africa have created enormous pressure on resources (Liniger et al., 1998), especially land, leading to land fragmentation and land scarcity. This in turn causes a considerable out-migration to the adjacent lowlands, which are relatively marginal. Farm sizes on the mountain slopes vary from 0.3 ha to 0.5 ha, while in the marginal lowlands they increase up to about 4 ha.

Poverty is a problem for mountain people despite the resource endowment of mountain areas. It is manifested in many dimensions – social, economic and political. Many of the poor depend on agriculture as a source of livelihood, and on land and water for success. Owing to limited opportunities for diver-

Fig. 9  
The highland-lowland system of Mt. Kenya covers several ecological belts that are being used by a broad range of stakeholders.

Photo: Urs Wiesmann, 1990



sification and the scarcity of land and water that can support agriculture, this livelihood system has become marginalised and insecure and therefore non-sustainable.

#### *Infrastructure and land use issues*

The high population densities described above have also created enormous pressure on resources, especially land, leading to non-sustainable sub-division and fragmentation of the land. Parcels of land have been reduced to small sizes, which are uneconomical and cannot support a household. As already noted, many farmers own small plots of land, while others are landless. This results in inequitable access to suitable and adequate land.

Because of their favourable natural setting, these areas are intensively used for crop production. Many farmers have adopted inappropriate land use management practices, with cultivation being undertaken on slopes with gradients above 50% and no terraces. Cultivation has also been extended to riverbanks, leading to erosion due to removal of trees.

The sustainability of mountain areas is becoming increasingly compromised due to deterioration of mountain land use systems and declining productivity. Poor land husbandry has led to erosion, declining soil fertility and land degradation, which have in turn led to declining crop yields, increased food insecurity and dependence on forest resources for livelihoods.

#### *Bio-physical and ecological issues*

Over-exploitation and destruction of forests through harvesting of natural hardwood for timber, cutting of trees for firewood, charcoal production, encroaching agriculture and fire have resulted in deterioration and loss of trees and forest habitat throughout the montane forests, culminating in serious loss of forest biodiversity (Lambrechts, 2000).

Deforestation and changes in forest structure have also led to inadequate availability and scarcity of water in mountain regions. Land degradation is also evident (Liniger et al., 1998). Other areas of concern in the mountains are the high risk of natural and human-induced hazards such as earthquakes and landslides and, recently, the effects of climate change, which are believed to be responsible for receding glaciers on Mt. Kilimanjaro.

## 5.4 Synopsis and syndrome contexts

The present chapter presents a synopsis of evaluation and weighting of the core problems described in Chapter 5.3. Core problems were evaluated in order to determine the level of magnitude and severity in each of the syndrome contexts. Weightings ranging from 1 to 7 were attached to each problem, with 7 signifying the worst-case scenario at the global scale. The results are summarised below.

### 5.4.1 Political and institutional realm

From Table 3 it can be observed that there are 7 core problems identified in the political and institutional realm. Except for the problem of eroding and weakening of community-based and traditional institutions, the core problems impact more heavily on the urban and peri-urban context than on the other syndrome contexts. The problems of conflicts, instability, lack of capacity and co-ordination among formal institutions, including erosion and weakening of community-based and traditional institutions, cut across all

Table 3

Core problems	Syndrome contexts							
	1 Urban and peri-urban	2 Semi-arid areas		3 Semi-arid areas		4 Highland-lowland		
		Mixed irrigation	Agro-pastoral	Pastoral	Protected areas	Mountains	Highland-lowland interactions	
1. Conflicts, instability, lack of capacity and co-ordination among formal institutions	6	5	5	5	5	5	5	
2. Eroding and weakening of community-based and traditional institutions	3	5	5	5	6	4	6	
3. Inadequate and conflicting policies coupled with lack of implementation	6	4	4	5	4	4	4	
4. Insufficient grassroots and institutional empowerment; failures of governance	5	4	4	5	2	6	6	
5. Corruption and obstructive power structures	6	3	3	2	6	6	5	
6. Inequitable and inadequate allocation of power and resources	5	3	5	5	2	3	5	
7. Dominating and conflicting world views and ethical values	6	2	2	2	4	4	2	

Political and institutional realm.

the syndrome contexts, more or less at the same magnitude. The highland-lowland context is plagued by bad governance and minimal community participation in the management of natural resources, especially in protected areas, as well as by corruption and power structures that hinder sustainable use of ecosystems.

### 5.4.2 Socio-cultural and economic realm

In the socio-cultural and economic realm, 8 core problems were identified, as presented in Table 4. From the table it appears that, with a few exceptions, the core problems are not heavily weighted over the syndrome contexts. The urban and peri-urban syndrome context is close to the worst-case scenario in terms of incompatible and fragile economic systems with limited market and employment opportunities, dominance of the global economy over national economies, and limited and inadequate essential social services and facilities. Similarly, the semi-arid syndrome contexts are seriously affected by the problems of social and ethnic tensions, which at times result in violent

Table 4

Socio-cultural and  
economic realm.

Core problems	Syndrome contexts							
	1 Urban and peri-urban	2 Semi-arid areas		3 Semi-arid areas		4 Highland-lowland		
		Mixed Irrigation	Agro-pastoral	Pastoral	Protected areas	Mountains	Highland-lowland interactions	
8. Social and ethnic tensions	4	5	6	6	4	3	5	
9. Violent conflicts	5	5	6	6	4	3	6	
10. Great socio-economic and gender disparities	4	4	4	5	2	4	5	
11. Unused innovative capacities, knowledge and skills	4	2	3	3	2	3	4	
12. Incompatible and fragile economic systems with limited market and employment opportunities	6	6	6	6	3	5	5	
13. Dominance of the global economy over national economies	6	5	3	3	4	2	2	
14. Limited and inadequate essential social services and facilities	6	5	5	6	3	4	5	
15. Development constraints resulting from cultural norms and practices	2	4	4	6	3	3	4	

conflicts over scarce natural resources. The highland-lowland syndrome context is least affected by these problems.

### 5.4.3 Population and livelihood realm

With the exception of the problems of rapid population growth, pressure and migration on the one hand, and prevalent poverty and livelihood insecurity on the other, which seem to cut across the syndrome contexts, most problems are concentrated in the urban and peri-urban areas and semi-arid areas with irrigation, and areas with mixed, agro-pastoral and pastoral uses (Table 5). Understandably, the urban and peri-urban syndrome context is greatly affected by almost all the core problems in this realm. Some clusters of these core problems also considerably affect the highland-lowland syndrome context areas.

Table 5

Core problems	Syndrome contexts							
	1 Urban and peri-urban	2 Semi-arid areas		3 Semi-arid areas		4 Highland-lowland		
		Mixed irrigation	Agro-pastoral	Pastoral	Protected areas	Mountains	Highland-lowland interactions	
16. Rapid population growth, pressure and migration	6	5	5	4	1	6	6	
17. Increasing social and economic dependency	5	5	5	6	4	4	5	
18. High risk and vulnerability to disease (AIDS, epidemics, emerging diseases)	6	5	5	6	4	4	5	
19. Prevalent poverty and livelihood insecurity	6	6	6	6	1	5	6	
20. Insecurity and rising crime (banditry, poaching)	6	4	4	5	5	4	4	
21. Violation of human rights and constraints on individual development potential	4	4	4	4	4	4	4	

Population and livelihood realm.

### 5.4.4 Infrastructure and land use realm

In the realm of infrastructure and land use (Table 6), 7 core problems hinder sustainability in the 7 syndrome contexts. The problems are present at varying magnitudes in the respective syndrome contexts. In some cases the worst-case scenario is at the global level.

The urban and peri-urban and the semi-arid areas with mixed farming, irrigation and agro-pastoral uses are significantly affected by the problems of inadequate sewage, sanitation and solid waste management. Equally problematic in the two context areas is water supply systems and management. These clusters of problems have the greatest order of magnitude in the semi-arid areas under pastoralism, therefore presenting the worst-case scenario at the global scale.

The mountains and highland-lowland syndrome context areas are grappling with the problem of inequitable access to suitable and adequate land, conflicts of interest and use of protected areas, and non-optimal productivity levels and inappropriate land use systems.

Table 6

Infrastructure and  
land use realm.

Core problems	Syndrome contexts							
	1 Urban and peri-urban	2 Semi-arid areas		3 Semi-arid areas		4 Highland-lowland		
		Mixed irrigation	Agro-pastoral	Pastoral	Protected areas	Mountains	Highland-lowland interactions	
22. Inadequate sewage, sanitation and solid waste management	6	5	5	7	5	4	4	
23. Inadequate water supply systems and management	6	6	6	7	3	4	5	
24. Inadequate and insufficient infrastructure	4	5	5	6	3	4	5	
25. Rapid and haphazard physical growth and expansion of cities and settlements	6	4	4	4	4	4	4	
26. Inequitable access to suitable and adequate land	5	5	5	6	2	6	5	
27. Non-optimal productivity levels and inappropriate land use systems	4	5	5	4	2	5	5	
28. Conflicts of interest and use of protected areas	5	3	5	6	6	5	5	

### 5.4.5 Bio-physical and ecological realm

There are 6 core problems related to the bio-physical and ecological realm, as outlined in Table 7. The urban and peri-urban context is not so greatly affected by these problems, save for the area of environmental pollution. The semi-arid areas with mixed irrigation and pastoral uses are faced with the problems of inadequate availability of freshwater, land degradation and serious loss of biological diversity. These problems, together with over-use of renewable and non-renewable natural resources, are also prominent in the highland-lowland syndrome context areas.

Table 7

Core problems	Syndrome contexts						
	1 Urban and peri-urban	2 Semi-arid areas		3 Semi-arid areas		4 Highland-lowland	
		Mixed irrigation	Agro-pastoral	Pastoral	Protected areas	Mountains	Highland-lowland interactions
29. Inadequate availability of freshwater	3	6	6	6	2	1	6
30. Land degradation	1	6	6	6	4	6	6
31. Loss of biological diversity	5	6	5	5	5	6	6
32. Environmental pollution	6	4	2	4	4	4	5
33. Risks of natural and human-induced hazards and climate change	5	3	3	4	5	4	4
34. Over-use of renewable and non-renewable natural resources	3	5	5	5	5	6	6

Bio-physical and ecological realm.

## 5.5 Research status and focus

### *Overview of research proposals*

Overall, 65 different research themes were formulated by the think tank meeting held in Nanyuki in May 2001. The distribution of the proposed themes was as follows: Urban and peri-urban (25); Semi-arid/mixed irrigation and agro-pastoral (16); Semi-arid/pastoral and protected areas (8); and Highland-lowland (16). After the research themes were formulated they were ranked according to criteria of importance and urgency, in order to develop a priority list. Table 8 presents the themes that received first priority.

Table 8

Research themes with highest priority.	Contexts	Research themes
	Urban and peri-urban	1. Ongoing conflicts and the capacity of existing political institutions to address these conflicts
	Semi-arid (mixed irrigation and agro-pastoral)	<ol style="list-style-type: none"> <li>1. Promoting farmer innovations for improved food security in arid and semi-arid lands (ASALs)</li> <li>2. Institutional arrangement for community participation in rural development</li> <li>3. Negotiation strategies between pastoralists and agro-pastoralists</li> <li>4. Water use conflicts and resolution mechanisms</li> <li>5. Strategies to enhance food security in ASALs</li> </ol>
	Semi-arid (pastoral and protected areas)	<ol style="list-style-type: none"> <li>1. Community awareness creation in the use of renewable resources</li> <li>2. People's perceptions of gender roles in sustainable resource management in ASALs</li> <li>3. Promotion of multiple land use in protected areas</li> <li>4. Developing appropriate management systems for equitable cost and benefit sharing in protected areas</li> <li>5. Local level initiatives for combating desertification and mitigating drought in ASALs</li> </ol>
	Highland-lowland	<ol style="list-style-type: none"> <li>1. Capacity building in natural resource management</li> <li>2. Prevalence of poverty and livelihood insecurity</li> </ol>

### **5.5.1 Research focus in the urban and peri-urban syndrome context**

*Ongoing conflicts and the capacity of existing political institutions to address these conflicts*

In the recent past the scene in major cities has been characterised by growing tensions and conflicts, whose origins can be traced to political, social, cultural and even economic causes. The manner in which these conflicts begin and spread unabated calls into question the ability of existing institutions to address them effectively. To date, there has been no research with respect to these issues; hence the high priority accorded to this theme.

### **5.5.2 Research focus in the semi-arid (mixed irrigation and agro-pastoral) syndrome context**

*Promoting farmer innovations for improved food security in ASALs*

The question of food security in the arid and semi-arid areas, especially with mixed use and irrigation practices, has long been a major problem. Various strategies have been tried and studies have been conducted to support the implementation of such strategies in order to improve the situation. Major work in this area done in the 1990s includes Adaptive Strategies of the Poor in Arid and Semi-Arid Lands (1994–95) by the International Institute for Sustainable Development (IISD), and Promoting Farmer Innovations (PFI) (1995–2000) in Kenya under the UNDP UNSO initiative.

*Institutional arrangement for community participation in rural development*

The term “community participation” (and debates associated with it) became fashionable among rural development agents and a catchword in donor circles throughout the 1980s and 1990s, to the extent that any proposal that did not feature the term stood little chance of acceptance. Unfortunately, while heavy investments were made in the name of community participation, very little effort was made to provide insight into the most pertinent questions about how to make it effective, in terms of institutional arrangements: the capacity of the communities in question; the policy and legislative framework necessary for an enabling environment; government institutions and their respective organisational structures (level of flexibility and accommodation); and monitoring and evaluation mechanisms, among others. The focus of research on this theme will be to address these issues in order to streamline the process of community participation and maximise the benefits associated with it.



### *Negotiation strategies between pastoralists and agro-pastoralists*

More often than not relations between pastoralists and agro-pastoralists are dominated by conflicts related to resource use (water and pasture). Several studies have been carried out to address these conflicts by providing a platform where negotiations for win-win solutions can be realised. In association with a study to develop a multi-level multi-stakeholder strategy for water resources conflict management (Kiteme, 2002), Water Users Associations were formed in the Ewaso Ngiro north subcatchments. These have proved to be effective negotiation platforms for resolving conflicts related to water use in the catchment (Wiesmann et al., 2000; Kiteme and Gikonyo, 2002). Fisher (1992) has also done research on consensual negotiations (conflict resolution, alternative conflict management, alternative dispute resolution [ADR], principled negotiation and conflict transformation) as an effective approach to conflict management. More research is needed, however, to help identify and promote negotiation strategies between these two communities for long-lasting conflict management solutions.

### *Water use conflicts and resolution mechanisms*

The implications of the conflicts discussed above are quite undesirable – loss of both humans and livestock. Even greater cause for concern is the fact that these conflicts have continued to intensify where they existed and have become evident in new areas. Therefore, the search for ways to minimise such conflicts, and for effective resolution mechanisms, has continued over the years. Greater efforts are still required in this direction, which is the reason this research theme received high priority during the SPSP workshop.

A considerable amount of work has been done in the two basins in the past decade. Mujwahuzi (2001), Kiteme (2000, 2002), Kiteme and Gikonyo (2002), Wiesmann et al. (forthcoming), and Wiesmann (1998) have looked at water use conflicts in both the Pangani and Ewaso Ngiro north basins, focusing on the various situations triggering conflicts in the two areas. The following have been identified as the main causes of conflicts: competition for scarce water resources, unmet expectations, needs and interests, unequal power or authority, differences in organisational status and influence, and jurisdictional ambiguities, among others. Different types of conflicts were found to exist in the basins. These include conflicts between small-scale and large-scale irrigators and upstream and downstream riparian irrigators, conflicts involving domestic water use and other uses, industrial vs. environmental use, agricultural vs. industrial use, and donors supporting different projects that depend on water as the main input in the production process.

### *Strategies to enhance food security in the ASALs*

Together with research focusing on strategies to promote farmer innovations and community empowerment (see discussions under research theme (1) above), more work has been done on the development of improved rainfed cropping systems incorporating rainwater harvesting (RWH)/conservation. In Tanzania, for example, between 1992 and 1999, a collaborative initiative between Sokoine University of Agriculture (SUA) and Newcastle University (UNEW) in the UK sought to conduct researcher-managed field experiments and develop a computer model of the key processes in various cropping systems.

### **5.5.3 Research focus in the semi-arid (pastoral and protected areas) syndrome context**

#### *Community awareness creation in the use of renewable resources*

Little if any research has been carried out so far in this area. Research in this area will promote generation and dissemination of information to create awareness among local communities about sustainable use of renewable resources, which is currently quite low. Concern about the growing overuse of these resources, which is elaborated elsewhere in this report, justifies the need to invest in research on this theme.

#### *People's perceptions of gender roles in sustainable resource management in ASALs*

The move to consider women's needs and roles as distinct from men's in the process of resource/environmental management has become quite popular, at least in the last 15 years (Joekes et al., 1995; Leach and Green, 1995). This essentially constitutes recognition of the role of gender in sustainable resource management.

Ongoing research in this area has tried to explore the interactions between urbanisation, environmental management and gender, by addressing questions about the opportunities and constraints experienced by women and men in managing natural resources, and how these hinder their practical and strategic needs (Mascarenhas, 1997). Questions about gender-related differences in rights, responsibilities and access to productive resources, and gender-related issues in environment policy planning (Ayoki, 2002) are also important. More research is still needed in order to shed light especially on the flawed conceptualisation of gender relations that ignores the differing interests of men and women, among other grey areas.

*Promotion of multiple land use in protected areas*

Although efforts to introduce an Integrated Conservation and Development (ICD) approach for the management of protected areas in East Africa have been made for more than a decade, most of the initiatives have failed to achieve the intended twin goals of biodiversity conservation and socio-economic development of the adjacent areas. This has been attributed to problems stemming from weaknesses in project design and implementation.

A considerable amount of research has been done in this area, focusing on issues such as wildlife conservation policies and laws (Lissu, 2000; Kangwana and Mako, 1999), and community conservation initiatives, among others. However, more is still required in order to help formulate better project designs and propose workable implementation approaches.

*Developing appropriate management systems for equitable cost and benefit sharing in protected areas*

The status of research and justification of the focus advanced for theme (5) above are also applicable here. In view of the problems associated with conservation, efforts to reconcile human interests with nature were initiated in several protected areas in the two countries (Ireneus et al., 1998; Boyd, 1999; Emerton, 1995). Others have focused on the economic value of wildlife for agricultural landholders in the adjacent areas, and how wildlife costs and benefits have been managed (Emerton and Mfunda, 1999). Additionally, Coughenour (1998) initiated a study seeking to develop an Integrated Modelling and Assessment System (IMAS) that integrates computer modelling, geographic information systems, remote sensing and field studies to provide the information and understanding necessary to conserve biodiversity, wildlife and ecosystem integrity while increasing pastoral food security. The IMAS is being implemented at Ngorongoro Conservation Area, Tanzania; Kajiado District, Kenya; and the Lake Mburo National Park in Uganda.

*Local level initiatives for combating desertification and mitigating drought in ASALs*

A considerable amount of research focusing on the key agents of desertification and drought, as described by the UN Convention to Combat Desertification (CCD), has been done in Kenya and Tanzania. An evaluation study by Kiteme (1999) on the local level initiatives supported by UNDP UNSO to combat desertification in two pastoral districts in Kenya elaborates the key challenges and important lessons, and suggests ways to improve the implementation of such initiatives. Other recent studies in this area have looked at

the effectiveness of customary tenure arrangements in controlling land use practices (Charles, 1996); land use and tenure changes (Heike, 1995); and institutional arrangements for environmental planning and management (Southgate and Hulme, 1996) as ways of enhancing local level participation in combating desertification and mitigating the effects of drought. Others have looked at the importance of Maasai indigenous knowledge systems in the utilisation, management and preservation of the natural resource base, on the one hand, and its relevance in the diagnosis, treatment and control of human and livestock diseases (Oduol, 1997) on the other hand.

#### **5.5.4 Research focus in the highland-lowland syndrome context**

##### *Capacity building in natural resource management*

Considering the current arrangements for natural resource management and evidence about the manner of resource use and management in the two countries, there is a great deal of action required in order to build capacity for resource management at individual, institutional and systemic levels. The current status of research on this theme is not very elaborate. The little that has been done is rather disjointed, owing to a focus at the individual level (individual, institutional or systemic), without attempting to examine the interconnectedness of the three. Research focusing on these aspects will therefore make a very significant contribution to sustainable resource management.

##### *Prevalence of poverty and livelihood insecurity*

Poverty and insecure livelihoods are now common phenomena in both the highlands and the neighbouring lowlands in East Africa. Population pressure and declining farm sizes have resulted in intensification of smallholder cropping activities. Higher cropping intensity places greater demands on soil fertility status that could culminate in a decline in productive capacity (Tanner, 1995). Well-being and livelihoods on Mt. Meru in Tanzania have become increasingly dependent on external resources. Other studies have attributed the growing incidence of poverty in the mountains to the manner in which distribution of the costs and benefits of conservation have favoured the conservators' side (Jambiya and Sosovele, 2001).

### **5.5.5 Themes for syndrome mitigation research: realms and priorities**

Of the 13 high-priority research themes, 9 were selected, with some modifications or as they were originally formulated, by the NCCR North-South in the region (see the list below). The research themes were deliberately selected in order to ensure adequate representation of all the contexts and realms, while at the same time looking for possibilities for topical integration in conformity with the special focus of IP1, which is the lead IP in the JACS East Africa. Individual Project IP1 deals with Conceptual Framework and Methodologies for Research on Syndrome Mitigation. Below are the 9 research themes finally selected for implementation:

1. Urban conflicts and the capacities of institutions to address these conflicts (U).
2. Institutional arrangements and capacities for syndrome mitigation (H-L, SA).
3. Conflict transformation and empowerment in and around protected areas (SA).
4. Negotiation platforms and social learning processes for sustainability (H-L, SA).
5. Local capacities for combating desertification and mitigating drought (SA).
6. Poverty reduction and securing livelihoods in marginal areas (H-L, SA).
7. Multi-stakeholder oriented alternatives in planning of land and water use (H-L).
8. Capacities and alternatives for sustainable natural resource management (SA).
9. Sustainable land use and water resource management in river basins (H-L, SA).

### 5.5.6 Institutional situation of research

The JACS East Africa is fairly well endowed with research organisations and institutions that are currently involved in a variety of research activities related to the present focus of mitigation research under the NCCR North-South framework. These research organisations/institutions can be classified as international, regional and local.

#### *International research organisations*

- African Wildlife Fund
- International Centre for Research in Agroforestry (ICRAF)
- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
- International Livestock Research Institute
- International Union for Conservation of Nature (IUCN)
- United Nations Environment Programme (UNEP)
- AFRICOVER

#### *Regional research organisations*

- Regional Land Management Unit (RELMA)
- AHI/AFRENA

#### *Local research organisations/institutions*

##### *Kenya:*

- Local universities and the associated/affiliated research institutes:  
University of Nairobi: Centre for Urban Research; Housing Research and Development Unit; Institute of Development Studies; Institute of Population Studies; etc., including other departments; Moi University, Kenyatta University and Egerton University
- Kenya Agricultural Research Institute
- Kenya Forestry Research Institute
- Kenya Industrial Research and Development Institute
- Department of Remote Sensing and Resource Survey
- Central Bureau of Statistics
- Centre for Training and Integrated Research in ASAL Development (CETRAD)
- Mpalla Research Centre

*Tanzania:*

- Local universities and the associated colleges and research institutes:  
University of Dar es Salaam: various departments including Institute of Resource Assessment (IRA), Institute of Development Studies, Centre for Housing Studies at the College of Lands, Architecture and Surveying (UCLAS); Sokoine University of Agriculture
- Tanzania agricultural research organisations (seven regional research institutes: SARI, Horticultural Research Institute, Tengeru, Mlingano Research Institute, etc.)
- Tanzania Forestry Research Institute
- Soil Conservation and Agroforestry Project for Arusha (SCAPA)
- Heifer Project International (HPI)
- Mweka College of Wildlife Management (MCWM)
- Tanzania Industrial Research Development Organization (TIRDO)

In addition to the research organisations elaborated above, there are a host of other private institutions and NGOs whose activities involve generation of information in one way or another. Together, these form a very important institutional research framework that the NCCR North-South programme can seek to establish research collaboration with.

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## 6 JACS Horn of Africa Managing Resources and Disputes in Uncertain Environments

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Fig. 1  
Sharing water  
equitably among  
different stake-  
holders in the  
Horn of Africa is  
a key to sustain-  
able development.  
Photo: E. Ludi, 1998

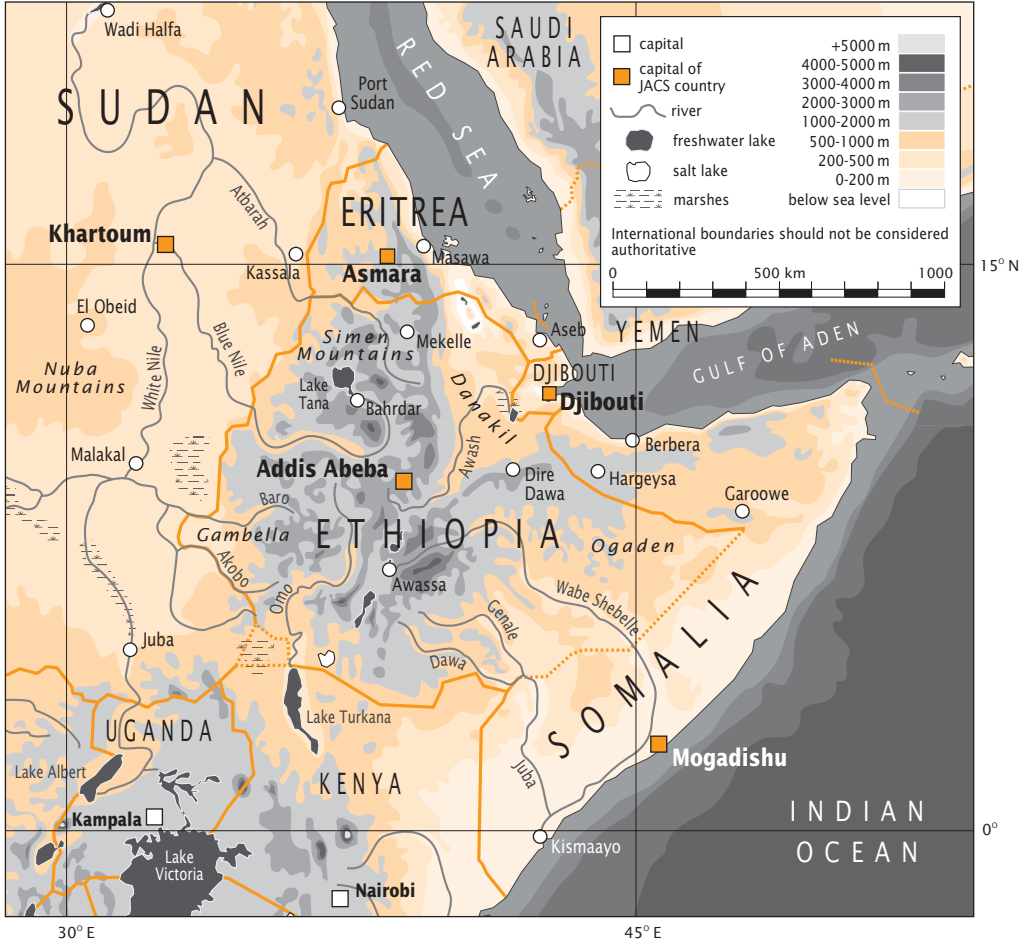


\* On behalf of all the participants of the workshop in Addis Abeba, Ethiopia, 2001 (listed in Annex 1, p. 447)

## **Abstract**

Although they have many different social, ecological and economic features, the Horn of Africa countries – Djibouti, Eritrea, Ethiopia, Somalia and Sudan – are closely linked historically, politically and environmentally. The Horn of Africa is one of the most food-insecure regions in the world: recurrent droughts and natural disasters hamper crop and livestock production. About 80% of the region is classified as arid or semi-arid. Large areas are unproductive, owing to natural conditions and severe human-induced environmental degradation. The average population growth rate is one of the highest in the world. Widespread poverty, underdeveloped infrastructure and social services, a long history of armed conflict – including civil and inter-state wars – massive influxes of refugees, displaced populations, weak state capacity and governance, and a lack of sub-regional cooperation are all responsible for these countries' low ranking in terms of human development.

On the other hand, the Horn of Africa has a history of several thousand years of very advanced civilisations with highly innovative populations that have continually adapted to varied and variable environmental, economic and political conditions. Strengthening this innovative capacity and creativeness, and capitalising on ecological diversity, are the keys to solving many of the region's problems and promoting sustainable development.



*Fig. 2: JACS Horn of Africa – Djibouti, Eritrea, Ethiopia, Somalia and Sudan. Research in the Horn of Africa is concerned with natural resource management and conflict management. Both are of central importance to the livelihoods of local communities in the region. Hence interdisciplinary analysis of ongoing transformation in the Ethiopian highlands and their lowland border regions is a prerequisite for a better understanding of current problems and opportunities.*



## 6.1 Introduction to the JACS Horn of Africa region

The Horn of Africa includes Djibouti, Eritrea, Ethiopia, Somalia and Sudan. With the exception of the Somali breakaway republics of Somaliland and Puntland, these countries are member states of the Intergovernmental Authority on Development (IGAD), which also includes Kenya and Uganda. While they have very diverse social, economic and ecological characteristics, the countries of the Horn are related geographically, historically and demographically. Politically, they share long histories characterised by armed conflict – including civil and inter-state wars – massive influxes of refugees, displaced populations, weak state capacity and governance, and contradictory policies. A lack of sub-regional cooperation adds to the political instability of the region: ethnic groups are divided by national boundaries drawn in colonial times, and the exchange and flow of persons and goods across borders is an integral part of local livelihoods.

The Horn of Africa is one of the most food-insecure regions in the world, characterised by recurrent droughts and natural disasters that hamper crop and livestock production. About 80% of the IGAD sub-region is classified as arid and semi-arid lands and sub-humid lowlands that receive an average of less than 400–880 mm of rainfall per year. Large areas are unproductive as a result of natural conditions and severe environmental degradation resulting from human activity. The average population growth rate is one of the highest in the world. Nearly half of the population is under 14 years of age. Widespread poverty, underdeveloped infrastructure and lack of social services are all responsible for these countries' low rankings in terms of human development.

Highland areas play an important role, as they are the source of major rivers such as the Nile, the Awash, the Genale-Dawa, the Wabe Shebelle and the Ghibe-Omo. The highlands are also a favoured settlement area. In Ethiopia alone, about 90% of the population is located in the highlands. Lowland and semi-arid areas make up most of Ethiopia and Eritrea and almost all of Somalia and Djibouti. With the exception of the Nuba Mountains and the highlands in the province of Kordofan, most of northern and western Sudan can be classified in the semi-arid to arid lowland categories. The lowlands of southern Sudan are primarily humid.

Highland-lowland interaction zones are important with respect to both natural resources and settlement. Highland regions are the water towers for surrounding lowland areas. High soil erosion rates and runoff peaks during the rainy season in highland areas negatively affect lowland areas. Different production systems in the highlands (mainly crop growing) and the lowlands (mainly livestock production) are linked through the exchange of their respective products and common use of natural resources in specific areas. Common use, however, is not free of dispute. Given increasing resource scarcity, tensions – and in some instances violent conflicts – are recurrent.

Table 1

	Year	Djibouti	Eritrea	Ethiopia	Somalia	Sudan
<b>Geography and social indicators</b>						
Surface (thousand sq. km)	2000	–	118	1104	638	2506
Total population (million)	2000	0.6	3.7	62.9	9.1	31.1
Annual population growth rate (%)	1990–2000	–	2.7	2.3	–	–
Urban population (% of total population)	2000	84	19	18	28	36
Annual urban growth rate (%)	1990–1995	–	–	3.4	–	4.6
<b>Development and economic indicators</b>						
GDP per capita, at purchasing power parities (USD)	2000	–	837	668	–	1797
HDI rank (total 173)	2002	149	157	168	–	139
Human Poverty Index (% of population below poverty line)	1989–2000	–	–	–	–	–
Population in agriculture male / female (% of labour force)	1980–1982* 1998–2000	–	79/ 88*	–	69/ 90*	66/ 88*
Public expenditure on education / health (% of total public expenditure)	1995–1997/ 1998	–/ 5.4	1.8/ –	4.0/ 1.2	–/ –	1.4/ –
Population with access to safe water /adequate sanitation (%)	2000	100/ 91	46/ 13	24/ 15	–/ –	75/ 62
<b>Environmental indicators</b>						
Crop land per capita (hectares)	1997–1999	–	0.12	0.16	0.13	0.56
Area of severe soil degradation (% of country)	2000	0	–	28	15	30
Protected area (% of total surface)	1999	–	5	5.5	0.3	3.6
Energy consumption per capita (kilogram of oil equivalent)	1999	–	–	290	–	503

Some key indicators for the countries in the JACS Horn of Africa.

Sources:  
UNDP, 2002;  
World Bank,  
2002a+b;  
FAO, 2000

## 6.2 Selection and justification of core problems

Widespread poverty, problematic resource use and inadequate policy responses by national and international actors characterise the three major problem clusters in the Horn of Africa. Economic development strategies are regarded as insufficient or altogether lacking. Legal frameworks and institutional support systems concerned with ownership and rights of use over natural resources are inadequate or non-existent. Moreover, policies are regarded as unbalanced and favouring certain segments of the population. Democratic governance remains an exception and recourse to violence to settle disputes is all too often the norm. On the other hand, the Horn of Africa is characterised by a history of several thousand years of very advanced civilisations and highly innovative populations that have continually adapted to varied and variable environmental, economic and political conditions. Strengthening this innovative capacity and creativeness and capitalising on ecological diversity are the keys to solving many of the region's problems and promoting sustainable development.

During the workshop held in Addis Abeba in 2001, participants decided on a slight modification of the syndrome contexts. In view of the situation in the Horn of Africa, it was decided to split the highland-lowland syndrome context in two; this resulted in a highland syndrome context and a highland-lowland syndrome context. Hence four syndrome contexts will be considered below, the first three of which have a pronounced geographical (topographical) focus:

1. Highland syndrome context
2. Highland-lowland syndrome context
3. Semi-arid syndrome context
4. Urban and peri-urban syndrome context

The highland and the semi-arid syndrome contexts were further subdivided as follows:

Highland syndrome context:

- North-eastern dry highlands (drought-prone, low potential, vulnerable to famine)
- Central mountainous highlands (mountainous, low potential, highly degraded)
- Central undulating wet highlands or plateaux (highly degraded, high potential)
- South-western wet highlands (susceptible to degradation, high potential)

Semi-arid syndrome context:

- Pastoralist lowlands
- Semi-humid and semi-arid lowlands in transition (locations along the Rift Valley escarpment, downstream valleys of major rivers characterised by sedentary processes and commercial agriculture)
- Humid lowlands

Highland areas have for centuries been favoured places for settlement and agriculture, as the ecological environment is more favourable than in the surrounding lowlands. Intensive agricultural use and expansion of cropland into marginal areas have led to severe degradation of the natural resource base. The secondary and tertiary sectors have remained undeveloped. Thus a surplus rural labour force cannot be absorbed. Land is very scarce in many highland areas, resulting in non-sustainable land use practices. People migrating to urban centres in search of employment find virtually no opportunities for income, owing to a limited demand for unskilled labour.

In lowland areas development of commercial farming and resettlement schemes have further marginalised pastoral communities. Competition among different production systems for natural resources is increasing. As a result, tensions have been building to the point of armed conflict in some cases. Although livestock is of considerable local economic significance and an important source of protein, sedentary agriculture has been developed at the expense of pastoralism. Recurrent droughts and violent conflicts have undermined pastoral coping mechanisms. The nomadic lifestyle has traditionally been misunderstood and most pastoral development strategies have generated little positive impact.

Urban centres are attractive to younger segments of the rural population, especially those who do not own land. Yet unproductive cities have limited capacities to provide jobs. Urban municipalities lack the means to develop necessary housing or infrastructure. Pollution levels are high and pose a major health risk. Economic development in and around cities is low and poverty is increasing. Hence unemployment is widespread, leading to crime, an increase in the number of street children and prostitution. The lion's share of resources committed to urban development is usually allocated to the capital cities. Regional centres have only recently gained more attention.

The following core problems were defined by participants in the pre-synthesis workshop. They constitute an overview of core problems identified in

each of the four relevant context areas of the JACS Horn of Africa, and have been defined in terms of the five major (slightly modified) scientific realms established in the original NCCR proposal.

Table 2

Core problems of the JACS Horn of Africa.	Realms	Core Problems (CP) <sup>1)</sup>
	Political & institutional	Dominating and conflicting world views and ethical values Poor, inadequate or contradictory policies; lack of policies Erosion of traditional institutions and/or weak and inadequate state institutions Inter-state mechanisms inadequate to deal with cross-border issues Poor governance and insufficient empowerment of actors Unequal distribution of power and resources
	Socio-cultural & economic	Inter-group tensions Violent conflicts Unused potential for innovative capacity and existing knowledge; constraints of traditional cultural systems Great socio-economic disparities Incompatibility of traditional and modern economic systems Fragility of economic systems due to inadequate capacity for capital formation and integration in the global market Dominance of the global system over national development
	Population & livelihoods	Population pressure and migratory movements Increasing age dependency ratio and/or unbalanced sex ratio Constraints on human rights and development of individual potential Poverty, inequitable entitlements and insecure livelihoods Dominance of subsistence production and limited alternative livelihood systems Risk of disease and susceptibility to health problems Socio-economic vulnerability to natural and man-made disasters
	Resource use, infrastructure & information	Weak socio-economic infrastructure Lack of appropriate technology Underdeveloped service sector Insufficient knowledge/information generation and management Conflicts of interest and conflicts over use of protected areas Problems of access to land and natural resources Ecologically non-sustainable land use practices
	Bio-physical & ecological	Inadequate availability and use of freshwater Soil degradation Degradation of vegetation cover Loss of biological diversity Risks of natural hazards and climate change Environmental pollution

<sup>1)</sup> Identified by JACS Horn of Africa workshop participants, May 2001

## 6.3 Status and dynamics of core problems

### 6.3.1 Highland syndrome context

#### *Policies and institutions*

In the Horn of Africa, ideologies changed with the frequent changes of political regimes in the region. In Ethiopia, for instance, economic policies changed from “semi-feudal” to “socialist-oriented” in the 1970s, and are presently “market-oriented” – all in a span of 30 years (Pausewang et al., 2002). Since independence in 1956, five changes of government have occurred in Sudan. Successive political regimes in the region have been accompanied by frequent restructuring of institutions and reshuffling of technical personnel. Hence long-term, coordinated development activities could neither be conceived nor carried out appropriately. Furthermore, confidence in the government has also eroded due to increased livelihood insecurity. This hampers relations with bilateral and multilateral donor agencies. Government attention varies substantially, depending on the area. Marginal mountainous communities and pastoralist areas receive far less attention and investment than highland areas near urban centres. Legal frameworks and institutional support related to tenure security and the right to use natural resources are inadequate or non-existent (Joireman, 2001; Yigremew Adal, 2000).

#### *Society, culture and economic conditions*

Peasant agriculture in highland areas is dominated by cereal, pulse and oil crop production. Livestock husbandry is an important economic activity, although secondary to crop production. Shoats (sheep and goats) as well as equines and bovines are raised (Hurni and Ludi, 2000; Mesfin Wolde Mariam, 1991). As land becomes increasingly scarce, groups engage in conflict over access to land, which takes the form of boundary disputes (Seyoum Gebre Selassie and Yacob Arsano, 2000). Such disputes often degenerate into armed conflicts, resulting in considerable loss of life and property. Ethnicity in this context is used as an organising principle, whereby the ethnic divide becomes an instrument for drawing the battle line (Fukui and Markakis, 1994).

#### *Demography and livelihoods*

Traditionally, the Ethiopian population settled and worked in the highlands for two reasons: firstly, to escape tropical diseases such as malaria, and secondly for security reasons, as Ethiopia has always been surrounded by hostile forces. The highlands served as a fortress for defence against external

Fig. 3

A decrease in the size of farms is forcing farmers to plough ever steeper slopes in the Ethiopian highlands. Heavy rains will wash away huge amounts of soil, as few investments are being made in soil conservation.

Photo:

E. Ludi, 1992



intrusion. Thus for environmental, political and military reasons, they have always been and continue to be densely populated. The population/land ratio has been rising precipitously with rapid population growth, particularly since the 1960s. As a consequence, the average farm size per household has been declining, which in turn has resulted in decreasing food production per capita. Population growth is such that land area per capita will decrease from 1.79 ha in 1985 to 0.67 ha in 2015 (Hurni, 1988).

#### *Resource use, infrastructure and know-how*

Land use in highland areas is dominated by rainfed subsistence farming, which has been practiced for centuries. Over-cultivation and over-grazing have resulted in unabated land degradation and depletion of natural resources. To date, none of the governments of the changing political regimes in Ethiopia, for instance, has adopted a land use policy or law. Physical infrastructure in Ethiopia and other countries of the Horn of Africa is weak. The road system is undeveloped and usually limited to connecting major towns. Communication networks are poor, inadequate or non-existent in small towns and most rural areas. In the agricultural sector, technology and research have so far failed to address the real needs of farmers. Much information is lost owing to a lack of documentation. Due to government monopoly of the information sector, there is little or no competition in production and dissemination of high-quality information.

*Natural resources and ecology*

Water availability is a serious problem in the north-eastern Ethiopian and Eritrean highlands. Annual rainfall is 700–1000 mm and is received mainly in July and August. Most is lost as runoff. Rainfall variability is high and drought is common. Water is generally in abundant supply in the rest of the highlands, although its use for irrigated agricultural and domestic purposes is minimal throughout the entire area (GoE, 1992). Soil erosion and land degradation have been continuing unabated for several centuries in the earliest highland settlement areas (Hurni, 1988). As a result, the hills and mountains are virtually exposed rocks, while other areas are severely degraded. It is estimated that about 63% of the NE highlands in Ethiopia is highly degraded, 16% moderately degraded and 21% slightly eroded (Hurni, 1988). Soil erosion and land degradation are also severe in the Ethiopian central highlands, especially on cultivated land. The original dry evergreen mountain forest and grassland climax vegetation of the north-eastern highlands has largely disappeared, due to clearing for cultivation that was practiced for centuries (Davidson, 1988). Severe, widespread deforestation has led to a critical shortage of fuel and construction wood, forcing farmers to use animal dung as fuel, thus further decreasing soil fertility. Most biological diversity in the Ethiopian and Eritrean highlands has been lost, with the exception of a wide variety of arable crops (Gedion Asfaw, 2000).



Fig. 4  
The rainy season  
in August. Herder  
boys standing by  
watch runoff and  
soil from arable  
land flow towards  
the river.  
Photo:  
U. Bosshart, 1992



### 6.3.2 Highland-lowland syndrome context

#### *Policies and institutions*

Highland-lowland interactions have been affected primarily by geopolitical factors, i.e. the convergence of geographical factors and political interests (Klein, 2002). Highland populations perceive themselves as part of the political centre, while lowlanders are considered part of the periphery. Hence, there is a pronounced imbalance of power between the two areas. There is no legislation or policy that adequately regulates the control or utilisation of fragile natural resources in the highland-lowland transition areas. Nor are there institutional frameworks or stable conflict management mechanisms to fall back on. This is obvious primarily at times of highland-lowland disputes over access to and control of highly sought-after resources. Traditional institutions are being increasingly eroded, while modern and/or state mechanisms have not been sufficiently developed to address the problems of highland-lowland interaction.

#### *Society, culture and economic conditions*

In Ethiopia and Eritrea, the highland-lowland divide is defined not only in terms of altitudinal and climatic factors, but also with respect to different ethnic identities. In northern Shoa, for example, the highlands are populated predominantly by the Amhara and secondarily by the Oromo, while the lowlands are mainly populated by the Afar (Seyoum Gebre Selassie and Yacob Arsano, 2000). Similar highland-lowland interactions are manifest in Sudan, for example in the Nuba Mountains. Highland-lowland interactions materialise not only in terms of different production systems, but also as a result of religious and socio-cultural divisions. The scarcity of population-sustaining resources in the highlands drives highlanders to lower altitudes in search of land to cultivate. Government-supported expansion of commercial agriculture into semi-arid pastoral areas further exacerbates this trend.

#### *Demography and livelihoods*

Highland/lowland differences in livelihood systems could make for greater complementarities. A limited assortment of goods is brought to weekly highland markets by lowland pastoralists, who in turn buy grains and consumer goods. Yet exchanges between the two systems remain limited. Pastoralists find better outlets for their products in countries beyond the Red Sea than in the Ethiopian highlands. They are too far away from important population centres to be reliable, cost-effective suppliers of livestock prod-



Figs. 5 and 6  
Muslims and  
Christians, seden-  
tary farmers and  
mobile pastoral-  
ists usually live  
peacefully side by  
side. Ethnic  
differences are  
instrumentalised  
to mobilise people  
when divergent  
interests are at  
stake.  
Photos:  
G. Schwilch,  
1994 (top),  
M. Portmann, 1994  
(bottom)

ucts. The major obstacle to easy livestock trade and better integration of the two production systems is lack of transportation and road infrastructure (Alemu Mekonnen and Dejene Aredo, 2000). In addition, both highlanders and lowlanders feel they are entitled to utilise resources in areas where they come into contact, and they claim the right to use and settle these areas. Entitlement is more secure in areas that have been settled for a long time than in recently settled areas.

*Resource use, infrastructure and know-how*

Regulation of land use systems in highland-lowland transition zones does not correlate with environmental requirements or with the needs of farmers and pastoralists. As all major rivers in Ethiopia cut through highland-lowland areas, upstream-downstream competition for water resources is common (Baechler et al., 2002; Yacob Arsano, 2002). Both traditional watering points and modern irrigation schemes are essential elements of highland-lowland interfaces. The few roads crossing the highland-lowland transition zones are not specifically intended to promote economic integration among highland and lowland community groups. Technological innovations are largely geared towards farming in highland communities; lowland communities are not a focus of attention for institutions involved in developing technologies and extension services. As highland-lowland interactions have been dominated by disputes over life-sustaining resources, there is little information coming from or going to these areas.

*Natural resources and ecology*

Population growth that results in a shortage of land for cultivation and grazing in the highlands forces highlanders to migrate to the lowlands. In turn, shortages of water and forage induce lowlanders to move to the highlands during the dry seasons. In areas of interaction, resources are subjected to various levels of stress from both directions. Although a water policy is formally in place, land and forestry policies are still unclear. Great temporal and spatial rainfall variability and moisture deficits occur in the dry lowlands but are less pronounced in the highlands and wet lowlands. Where rainfall variability is high, the ecology is fragile and changes in vegetation cover lead to micro-climatic deterioration, crop failure and conditions that result in famine. As livestock watering points are not well developed and protected, there is an inevitable danger that water will be contaminated by animal waste. Moreover, wind erosion in lowland areas causes dust pollution in adjacent areas.

### 6.3.3 Semi-arid syndrome context

#### *Policies and institutions*

Historically, relations between the state and pastoral communities have been characterised by systematic marginalisation, physical violence, misguided development policies, frustration and distrust (Suliman, 1999). Governance in the pastoral lowlands is dominated by an agricultural mindset, especially in Ethiopia and Eritrea. Traditional institutions in lowland areas are being eroded, and the modern state structure is still undeveloped and too weak to take over specific tasks. The lowland areas are vulnerable to cross-border conflicts, and there are lingering internal inter-group conflicts over life-sustaining resources (Mkutu, 2001). The “frontier phenomenon” of banditry and chronic insecurity exists in provincial areas where state authority is weak in terms of legitimacy, monopoly on violence and institutional capacity. State authorities practice favouritism in dealing with competing user groups and often instrumentalise resource conflicts for political reasons (Salih and Markakis, 1998).

#### *Society, culture and economic conditions*

As in other places around the world, pastoralism is perceived as economically inefficient, environmentally damaging and politically suspicious by governing elites in the region. The substantial contribution of livestock raising to national economies, food security and, in the case of Somalia, to export is rarely acknowledged. Sedentary crop farming and agro-pastoralism remain the primary focus of government policies. Pastoral production is regarded as backward and an obstacle to modernisation and economic growth. Mobility – the key feature and main coping mechanism of nomadic and transhumant pastoralists – is being increasingly hindered by political, economic and climatic obstacles. As a consequence of the phenomenal expansion of plantation agriculture over the last half-century, massive displacement of indigenous population groups has taken place; the vast majority of those affected are members of nomadic pastoralist tribes (Hogg, 1997; Salih et al. 2001; Seyoum Gebre Selassie, 1996).

#### *Demography and livelihoods*

A wide array of different pastoral ethnic groups inhabit most of the landmass in the Horn of Africa. Raising of large and small ruminants is the main source of livelihood for these nomadic and agro-pastoral communities. Pastoral livelihoods have been seriously endangered by recurrent drought, violent conflicts, erosion of traditional institutions and integration into national

Fig. 7

Borama in Somaliland. Globalisation offers new opportunities such as telecommunications, access to the Internet and instant messaging between diaspora and original communities. But key services such as education and health services have not yet been provided.

Photo:

D. da Rugna, 2002



economies; in many cases this has led to chronic forms of poverty, massive displacement and destitution. Land encroachment by new user groups has increased competition for meagre resources with and among small-scale farmers and pastoral populations. The lack of appropriate land tenure policies, continuing pressure on resources and very poor social services further add to the burden of survival for pastoralists. However, herdsmen in the Horn have learned to cope with many of the harsh conditions they face. Appropriate pastoral development policies and strategies that truly take their interests into account have not yet materialised (Hogg, 1997; Coppock, 1994).

#### *Resource use, infrastructure and know-how*

Prime grazing areas have been opened up for resettlement schemes, commercial ranching and large-scale irrigation agriculture, or claimed by government agencies for establishment of national parks and protected sanctuaries. Shifting cultivation continues to be a dominant form of production in many lowland areas. Infrastructure development is severely hampered by harsh environmental conditions, as well as by general government neglect. All-weather roads are rare, and public services such as schools and health centres are often virtually non-existent. Little attention has been given to conservation and improvement of existing traditional knowledge with respect to livestock husbandry, breed selection or resource conservation and

management. Communication networks are generally poor in the lowlands. Yet some types of information travel rapidly, as communities have strong cross-boundary links. The latest developments can be followed, thanks to radio and money-transferring networks, which connect the most remote Somali areas with the global economy.

#### *Natural resources and ecology*

The lowlands can best be characterised as hot and dry. The average temperature is 25°C or more, rainfall is sparse and water is scarce. Ecological conditions are at non-equilibrium, with rainfall highly variable, both temporally and spatially. During the rainy season, vast areas are open to grazing. During the dry season, however, herds are brought to the vicinity of water points such as perennial rivers and water wells. Available water is often inadequate, and overuse and degradation are common phenomena. The dry lowland areas are especially vulnerable to wind and water erosion, even with little or no pressure on vegetation from grazing animals. Overgrazing is common, and particularly acute around watering points. Moreover, cutting of trees to open up new areas for cultivation, obtain timber for construction, and secure fuelwood and charcoal seriously diminishes the vegetation cover. In some areas, production of charcoal for export has deforested entire strips of land.

### **6.3.4 Urban and peri-urban syndrome context**

#### *Policies and institutions*

Poor urban planning and management is a general problem in all cities in the region (Mehret Ayenew, 1999). Historically, most cities and towns grew out of military garrisons. In Ethiopia, urban institutions have changed frequently since the 1974 Revolution, reinforcing bureaucratic mechanisms, instability and inadequate urban management. Municipalities and urban management institutions have been used for political mobilisation by previous regimes as well as the current one. In Addis Abeba, for instance, no participatory management that includes civil society has ever taken place, nor has there been any mainstreaming of the informal sector. Uncontrolled growth of urban centres represents a challenge that policymakers have so far been unable to tackle adequately. The tendency of peoples and governments to focus attention on the development of a principal city has taken place at the expense of other regions and urban centres. Relationships between capital cities and their respective “hinterlands” are thus often exploitative.



Fig. 8  
Capital cities such as Addis Abeba, Ethiopia, often grow rapidly but without plan. Infrastructure development cannot cope with population growth. Photo: E. Ludi, 2001

#### *Society, culture and economic conditions*

Urban economies are, by and large, consumption rather than production-oriented. Cities do not produce much in the way of technology or modern inputs from which the rural hinterlands could easily benefit. Inventive entrepreneurship and technological innovation are inadequate or non-existent, due to a lack of priority and support for policymaking. However, urban areas serve as the main markets for the primary products produced in their rural surroundings. Capital cities attract the able-bodied and aspiring elements among the rural population, thus draining the latter of vital human resources. In particular, young members of the population are drawn to urban centres by the tens of thousands in search of jobs, education and services. This continuous urbanisation places a heavy strain on urban economic and social infrastructure and amenities. It also contributes to urban unemployment and poverty, substandard housing and poor health conditions, all helping to make the city “unmanageable”.

#### *Demography and livelihoods*

The demographic evolution of cities in the Horn must be understood in a wider economic and political context. As the Ethiopian case demonstrates, the country’s longstanding food insecurity results from a rising popula-

tion/arable land ratio, resulting in a pronounced decline in average farm size per household. Urban centres are absorbing large-scale migrations that constitute an excess labour force, as well as people displaced by drought and war in search of better living conditions. As job opportunities are limited, many of these newcomers join the growing ranks of the poor and the destitute in cities. Vulnerable urban populations include prostitutes, street children, beggars, and displaced and handicapped persons, who survive with extremely limited means, shelter and hygienic facilities.

#### *Resource use, infrastructure and know-how*

Most cities in the Horn of Africa emerged spontaneously and grew without attention to land use planning. It is common to find industrial plants, residential housing and office buildings in the same areas in Addis Abeba, as well as in other medium-size and small cities in the country. Cities often expand horizontally into rural areas without the concomitant infrastructure needed for appropriate urban development. Poor infrastructure development has been a disincentive to investment, especially in medium-size cities. Small and medium-size cities are more of an agglomeration of settlements with rural features, lacking industry and modern services. Industry, modern services, higher-level training and research institutions, skilled manpower, etc., are concentrated in the big cities. Available technologies are bound to be dependent on foreign imports. Cities are fortunate in having the greatest concentration of national information systems, including TV networks, FM and MW radio stations, and electronic and print media. Cities serve as centres for collecting, processing and disseminating information.

#### *Natural resources and ecology*

Urbanisation is not a planned operation. Consequently, services and infrastructure such as domestic water supply, sewage, sewage disposal, and industrial and domestic waste disposal are extremely weak. The main reasons for the low level of public service are very high rates of population growth and a shortage of financial resources. Similarly, both solid and liquid waste disposal systems are poor. As a result, urban areas are extremely dirty and pervaded by bad odours. Latrines are in very short supply. The sides of streets and drainage systems are widely used for sanitation. As sewage treatment is virtually non-existent, solid and liquid wastes are directly discharged into the streams that traverse urban areas, which are dangerously contaminated when they reach downstream water users. Both humans and livestock suffer from contaminated water originating in major towns. Solid waste management is also in a deplorable state, and municipalities do not seem to have developed or be able to develop the necessary capacity for this service.



## 6.4 Synopsis and syndromes

### 6.4.1 Synoptical overview of syndrome contexts

#### *Highland syndrome context*

The most serious problem in the Ethiopian highlands is a subsistence-oriented and exploitative farming system. More than 80 % of the population is still engaged in subsistence agriculture, and many other known problems are a consequence of this. Resource degradation, for example, is not an inherent problem of the farming system, but a result of people being forced to use areas unsuitable for crop cultivation. Several underlying problems are responsible: poor governance that fails to give adequate attention to proper land and resource use; deficient policy development and implementation; lack of vision related to development of other economic sectors, with the ultimate goal of reducing land pressure; institutional instability; extremely high poverty levels among the vast majority of the rural population; and weak physical infrastructure and social services.



Fig. 9  
Non-sustainable  
use of arable land  
is widespread in  
the densely popu-  
lated highlands,  
leading to severe  
soil degradation.  
Photo: G.  
Schwilch, 1994



Fig. 10  
Afar pastoralists  
and Amhara  
farmers exchange  
goods on the mar-  
ket in Aliyu Amba,  
Ethiopia. Comple-  
mentarities in the  
two prevailing pro-  
duction systems  
should be strength-  
ened and would be  
beneficial to both  
sides. Photo:  
E. Ludi, 1998

#### *Highland-lowland syndrome context*

The prevailing land use system is ranked as the leading problem in this context area. It has been argued that other problems, such as tensions and conflicts, are a result of prevailing production systems. Population pressure forces farmers to encroach on land used by others. This trend is intensified by climate change, reducing the amount of grazing land available to lowland pastoralists, who move to areas claimed or inhabited by sedentary agriculturalists. Farmers, on the other hand, search for new arable land in lowland areas claimed and used by lowland pastoralists. Geopolitically speaking, ethnic differences are often invoked to underpin these claims. Ethnicity works as an organising principle whereby property rights must be defended against outsiders. Adverse economic policies, failure to support other economic sectors and lack of investment in physical infrastructure and social services are seen as reasons that keep farmers and pastoralists bound to a subsistence mode of production.

#### *Semi-arid syndrome context*

Growing poverty is the major problem identified in the lowlands. Inadequate or absent land use and development policies are a second major problem. These problems are clearly linked. Specific segments of the population in

lowland areas are marginalised. Pastoralists come under pressure as dry-season grazing land along watercourses is increasingly appropriated by farming enterprises using large-scale irrigation. At the same time, pastoralists and their livestock herds also suffer the most from the effects of climate change. A lack of marketing opportunities owing to insufficient infrastructure development and insufficient cross-boundary cooperation further aggravates the problem.

Fig. 11

Sheiks debating, Somaliland. Where government and administration are weak or even absent, as in the case of Somalia, traditional institutions concerned with governance, such as deliberations between clan elders in Somali, play a vital role.

Photo:

D. da Rugna, 2002



#### *Urban and peri-urban syndrome context*

The most serious problems of urbanisation are limited resources for planning and development related to rural areas, and the lack of finances, manpower and skills in urban municipalities. This lack of resources is responsible for unplanned and chaotic growth in urban centres. It also aggravates the inability of underdeveloped infrastructure to cope with a growing number of urban dwellers. Poor urban planning and the primacy of politics over technocratic administration and professional urban management are additional factors. Moreover, the potentials of urban centres are also not well understood, while the focus on agricultural development is too pronounced. Urban squalor, lack of basic infrastructure such as adequate water supply and sanitation systems, overcrowding in educational and health facilities, and great numbers of children living and working in the streets are the results of poorly functioning centre-periphery relationships.

### **6.4.2 Synoptical overview of core problems**

#### *Policies and institutions*

Ideologies and political systems change with frequent changes of political regime in the Horn of Africa. Hence development policies also change with the coming of new political systems and ideologies – most often without a

clear vision of development needs and possibilities in relation to concrete actions. Due to the frequent and politically motivated restructuring of institutions, proper coordination and integration of development efforts are lacking. There is no clear resource tenure to regulate access to and protection of life-sustaining resources in the Horn of Africa. The main problem in land tenure is insecurity of ownership among users, leading to overuse of natural resources and conflict resulting from unregulated competition for access. Within each context area, the issues of entitlement, access to, and control over resources are more important than climatic and physical changes in the natural environment.

This disadvantageous political and institutional set-up is less severely felt in the highlands than in highland-lowland or lowland areas, as many policies focus on issues concerned with highland sedentary agriculturalists. Because of the predominance of highlanders in the national political arena, problems occurring in the lowlands are not properly addressed. Even worse, there is a feeling that lowland areas, with their predominantly pastoralist populations, should be more actively promoted for large-scale irrigated farming in certain areas.

#### *Society, culture and economic conditions*

The problems of environmental deterioration and loss of population carrying capacity are so pervasive in the Horn of Africa that the declining productivity of the land, in combination with cyclical droughts, has frequently resulted in high food insecurity, displacement and poverty. Coupled with rapid population increase and a rudimentary division of labour, these developments mean that traditional economies are continuing to lose ground.

#### *Demography and livelihoods*

As national policies are lacking or improperly implemented, agricultural practices are not sustainable; most of the population still engages in subsistence production. Land users are therefore forced to use the land in a non-sustainable manner, in order to extract as much as possible, without consideration of negative impacts. Particularly in highland-lowland interaction zones, demographic pressure and related coping mechanisms lead to clashes between different user groups.

The problem of urbanisation cannot be fully understood by simply considering its symptoms. Urban squalor, lack of basic infrastructure – including adequate supplies of water, sanitation systems, and education and health

care facilities – underemployment and life in the streets are the results of poorly functioning centre-periphery relationships. Concentrated efforts to develop a principal city and a handful of others, while totally neglecting regional towns, have left a gap in development between centre and periphery. As rural living standards remain at a standstill and even decline, the strong and able-bodied seek their fortunes in urban areas.

*Resource use, infrastructure and know-how*

Current land use systems and land management technologies are not appropriate for the lowland areas, as they were developed for highland situations. Moreover, the traditional and relatively well adapted pastoral land use system is increasingly being undermined by the expansion of large-scale irrigated farming in more humid areas. The pastoralist economy, though lauded for its environmental friendliness, is not developing, owing to past and present benign neglect by the state. The scenario of the “tragedy of the commons” is being played out, as pastoral households try to maximise herd size, often at the expense of other households, thus undermining the sector’s viability.

There are no policies regulating the use and management of such resources as arable land, forest areas, wetlands, rangelands or water systems. There are no reward or sanction mechanisms in place to promote sustainable use of these resources. Exploitative use is therefore common, and preventive or restorative measures have not been implemented.

Undeveloped infrastructure is a major impediment to economic and social development in the entire Horn area. Transport and communication infrastructure is the poorest in the world. Settlements are far apart and far from economic centres. The rugged highland and rough and hot lowland areas are not easily accessible; this constitutes a major obstacle to economic and social development. Although cities are better equipped with basic infrastructure, they are by no means keeping pace with the rate of urban expansion and population growth.

A general loss of information is perceived as a problem, keeping communities in all context areas from reaping the benefits of knowledge transfer. Neither research nor extension services are demand-oriented. Packages are developed by research organisations imported from abroad, and then transferred to rural areas without prior assessment of specific socio-economic and ecological environments, and without taking account of options or the

possible advantages of improving and adapting existing technologies. Traditional technologies are considered backward and hence ignored.

### *Natural resources and ecology*

Acute shortages of freshwater, unreliable rainfall, severe soil erosion and land degradation, serious loss of biological diversity and a high risk of natural hazards and micro-climatic deterioration are the core problems in the highlands. The core problems in the lowlands are acute shortages of freshwater, unreliable rainfall, severe soil erosion and land degradation by wind and water, serious loss of biological diversity and moderate risk of natural hazards and micro-climatic deterioration.

Table 3

<b>Core problems (1 for each realm)</b>	<b>Highland</b>	<b>Highland – lowland</b>	<b>Semi-arid</b>	<b>Urban / peri-urban</b>	Impact of most important core problems in the JACS Horn of Africa in syn- drome contexts.
Lacking, inadequate and/or contradictory policies	High	High	High	Very high	
Great socio-economic disparities	High	Very high	High	Very high	
Dominance of subsistence production and limited alternative income opportunities	Very high	High	High	High	
Ecologically non-sustainable land use practices	Very high	Very high	High	n.a.	
Soil degradation	Very high	Very high	High	n.a.	

Table 4

Most important  
core problems and  
their relative  
weighting.

	Core problems	Highland	Highland – lowland	Semi- arid	Urban/ peri- urban
Weighting (1: least, 7: most important / severe)					
<b>Policies and institutions</b>					
1	Dominating and conflicting world views and ethical values		5.7		4.3
2	Poor, inadequate or contradictory policies; lack of policies	5.3	5.7	5.7	6
3	Erosion of traditional institutions and/or weak, inadequate or unstable state institutions		5.7	3.7	
4	Inter-state mechanisms inadequate to deal with cross-border issues	6	6.2	3.7	
5	Failure of governance and insufficient empowerment of actors		5.6	3.7	
6	Unequal distribution of power and resources	5.5	4.5	5	4.6
<b>Society, culture and economic conditions</b>					
7	Inter-group tensions		5.7	5	
8	Violent conflicts			4.6	
9	Unused potential for innovative capacity and existing knowledge; constraints of tradition-bound cultural systems	5			
10	Great socio-economic disparities		6.1	4.7	4.3
11	Incompatibility between traditional and modern economic systems		4.3	4	
12	Fragility of economic systems due to inadequate capacity for capital formation and integration into the global market	4.75			4
13	Dominance of the global system over national development		5.8		4.3
<b>Demography and livelihoods</b>					
14	Population dynamics and migratory movements	5.5	6	4.7	5
15	Increasing age dependency ratio and/or unbalanced sex ratio		6	5.3	4.6
16	Constraints on human rights and development of individual potential				
17	Poverty, inequitable entitlements and insecure livelihoods	5.5	6	6.3	5.3
18	Dominance of subsistence production and limited alternative livelihoods	6.75	6.3		4.3

Table 4  
(continued)

	<b>Core problems</b>	<b>Highland</b>	<b>Highland – lowland</b>	<b>Semi- arid</b>	<b>Urban/ peri- urban</b>
19	Risk of disease and susceptibility to health problems			4.6	3.3
20	Socio-economic vulnerability to natural and man-made disasters	5			
<b>Resource use, infrastructure and know-how</b>					
21	Weak socio-economic infrastructure	5.25		5.3	4.3
22	Lack of appropriate technology	5	4.7		
23	Weak social and economic services		4.8	4	
24	Inadequate knowledge/information generation and management	5			
25	Conflicts of interest and conflicts over use of protected areas			4.6	
26	Problems of access to land and natural resources	4.75	6		
27	Ecologically non-sustainable land use practices		6.3	2.3	
<b>Natural resources and ecology</b>					
28	Inadequate availability and use of freshwater	2.75		3.6	
29	Soil degradation	5.5		3.6	
30	Degradation of vegetation cover	2.25		4.3	
31	Loss of biological diversity	5		4.3	
32	Risk of natural hazards and climate change	3.75	4.9	3	
33	Environmental pollution				

Table based on responses by workshop participants, May 2001



## 6.5 Proposed mitigation research

During the workshop held in Addis Abeba in 2001, a total of 50 research themes were formulated. A synoptic overview of the most urgent research themes in each realm is presented below.

### 6.5.1 Identified research needs

#### *Policies and institutions*

**Promoting sound land use policies and management:** The lack of land use policy and problems related to insecurity of land tenure are major impediments to sustainable development in the Horn of Africa in all syndrome context areas. There is a need for research to support policies that focus on appropriate land use planning and ensure land tenure security for land users in all context areas (e.g. Alemu Mekonnen and Dejene Aredo, 2000; GoE, 1992, 1994; Gedion Asfaw, 2000; KFPE, 2001). In the highland-lowland interaction zone, there is a need to understand the forces that drive expansion of highland populations into the lowlands and downstream valleys. Knowledge about how to adequately utilise and conserve natural resources in the transition zones should be enhanced, with the objective of developing proper land use policies in these highly disputed areas. Studies of land use dynamics and their impact on natural resources are necessary in order to identify the potentials and constraints of current land use systems, with a view to proposing appropriate alternative land use systems in the highlands. Identification of current government and local community management practices and inter-group conflicts over resource use is fundamental to guiding the development of resource management, conservation and environmental rehabilitation strategies.

**Strengthening good governance and regional cooperation:** Because countries in the Horn of Africa are closely interlinked, there is a need for thorough early warning of conflict and for research to prevent inter-state conflicts. Cross-border settlements, trade, natural resources, cultural practices and patterns of conflict and cooperation can be taken as baseline elements for investigation (e.g. Ayalew Gebre, 2001; Baechler et al., 2002; Cliffe, 1999; Getachew Kassa, 2000; Hogg, 1997; Salih et al., 2001). The problems of the semi-humid and semi-arid pastoralist lowlands should be addressed within the overall framework of IGAD, which has a fairly good idea of the problems and has been in existence for many years. Similarly, the instability of political systems, the inadequacy of democratic processes, fre-

quent changes in political institutions, etc. are considered major obstacles to societal participation at local, national or regional levels. Research should address these political processes by identifying strategies for improvement of good governance and democratic involvement at all levels (e.g. Lederach, 1997; Nicol et al., 2000; Young, 1998).



Fig. 12  
Visits by policy-makers to rural areas contribute to the formulation of policies that address the needs of local populations.  
Photo:  
E. Ludi, 2000

#### *Society, culture and economic conditions*

**Investigating alternatives to primary production:** One obstacle to sustainable development in the Horn of Africa is the dependence of a majority of the population on primary production (e.g. McSpadden, 1996; Mesfin Wolde Mariam, 1991; Yared Amare, 2001; Zenebework Tadese, 2001). Alternative livelihood systems with a specific emphasis on employment opportunities outside the farming sector, better integration of rural and urban areas, and the sustainable integration of local agricultural markets into the wider economy need to be explored. In regard to the above-mentioned context of highland-lowland interactions, special consideration should be given to elements in each system that promote conflict and favour cooperation and mutual integration.

**Supporting sound urban development:** In the urban context, further investigation is needed of centre-periphery relationships and of their poten-

Fig. 13  
Creating alternative sources of income helps to reduce the dependence of the rural population on natural resources.  
Photo:  
M. Bisig, 1994



tially beneficial impacts on regional economic development and various stakeholders. Models of urban development need to be tested empirically and best practices determined (e.g. Mehret Ayenew, 1999).

#### *Demography and livelihoods*

**Investigating alternative livelihood strategies:** The almost total lack of knowledge about the extent, quality and geographic distribution of natural resources is a major obstacle to development in the Horn of Africa. Excessive reliance on a limited range of resources and products destined for both domestic consumption and export is one of the consequences of this knowledge gap. The absence of alternative livelihood systems forces people to rely on subsistence agriculture and animal husbandry, which offer very few economic benefits (e.g. Mesfin Wolde Mariam, 1986; Seyoum Gebre Selassie, 1998; Tegegne Gebre Egziabher et al., 1999). However, regional ecological diversity can be expected to offer many additional possibilities for communities to secure adequate livelihoods – although this will require more detailed investigation. Research should therefore assess natural resource endowment and management strategies with a view to improving farming systems and diversifying livelihood strategies.

**Enhancing research in pastoralist contexts:** The lowlands have been neglected in terms of development and research. Knowledge about herdsmen,

their systems of production and their ways of utilising natural resources is very limited. Although some research has been done, it has frequently emphasised crop and livestock systems and given inadequate attention to natural resources (e.g. Mitiku Haile et al., 1999; Pastoralist Forum Ethiopia, 2001). Socio-economic research in the lowlands needs to focus on the development of appropriate and diversified livelihood strategies for pastoralists. Options for integrating the livestock sector into the wider market economy also merit further attention, as do studies on modes of resistance to modernisation in the agricultural and livestock sectors.

*Resource use, infrastructure and know-how*

**Integrating modern and traditional knowledge systems:** The Horn of Africa is heavily dependent on external modern technology. Locally available technology is inadequate to address the needs of both rural and urban communities. There is a need for research that focuses on evaluation of traditional knowledge and technologies available throughout the sub-region, and on integration of such knowledge and technologies into adaptable expertise that is accessible to those who need it. This will enhance livelihoods in particular, and national socio-economic development in general. One of the reasons why soil and water conservation methods were not readily adopted by farmers was that the technologies introduced did not improve on traditional technologies. Thus in order to increase the chances for wider application of conservation practices, it is necessary to compare research results with traditional practices. This requires making an inventory of traditional practices and properly evaluating the effectiveness of each practice (e.g. WOCAT).

**Innovative water management:** In the highlands, current research on water issues seems to be limited to recording flow and sediment load data for major streams. This recording network is of very limited density. A number of policy-related issues, such as cost recovery mechanisms, participation by involved communities, land policy and a framework for monitoring and evaluation, have not yet been properly elaborated for peasant irrigation schemes. Moreover, there does not seem to be any systematic assessment of traditional irrigation practices. There is a long tradition of irrigated agriculture in Ethiopia, Eritrea and Sudan. Medium- and large-scale irrigation schemes are carried out by government agencies and private enterprises. There is also an increasing trend towards water harvesting and storage in micro-dams for utilisation below the dams (e.g. Dessalegn Rahmato, 1999; Faud Adem, 2001; Flintan and Imeru Tamrat, 2002; Waterbury, 1979; Yacob Arsano, 2002; Zewde Abate, 1994). Hence there is a need for research on

mitigation of upstream-downstream conflicts and other problems related to water use, in light of national water management policies and traditional rules governing water use in various localities in the countries of the Horn.

**Supporting agricultural research:** Agricultural research is usually undertaken on the basis of “commodity” and “non-commodity” programmes. Research in some “non-commodity” programmes such as natural resources has been and still is fragmented and uncoordinated. There is a need to develop innovative methods of generating and disseminating knowledge (e.g. Berhanu Debele, 1997; Mitiku Haile et al., 1999).

**Reinforcing participatory resource management:** Assessment and development of appropriate resource-sharing mechanisms is a subject that requires study and elaboration. This should involve participation by local residents in design and implementation of resource management strategies for their area, as well as fair benefit-sharing mechanisms, based on the norms and customs of the communities involved. Unless this is done to the complete satisfaction of the parties involved, attempts to protect natural resources, wildlife areas and natural forests will be in vain. Forests and wildlife areas are traditionally regarded as state assets, which need to be protected at all costs from any use by local communities. Preparation of man-

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Fig. 14  
Bringing together  
different stake-  
holders – men and  
women, farmers,  
technical and  
administrative  
staff – is a means  
of mutual learning  
and empower-  
ment.  
Photo:  
E. Ludi, 1998



agement plans for natural forests and wildlife areas should be undertaken in consultation with all stakeholders, including government, extension services, land use planning and conservation units, and local authorities and communities, and involve their direct participation. There is an urgent need to develop the institutional arrangements required for such integration and cooperation, as they do not presently exist (e.g. Hurni and Ludi, 2000; EPA, 1997; Gedion Asfaw, 2000).

**Supporting forestry and wildlife management:** Previous forestry research in Ethiopia was hampered by changing state structures. Moreover, the programmes implemented were limited to exotic silvicultural species and some aspects of wood technology, at the expense of attention to management and use of existing forests and indigenous tree species (e.g. Azene Bekele, 2000; GoE, 1994; Reusing, 1998). To ensure proper protection and management of wildlife and natural forests, it is essential to involve communities by means of an appropriate incentive mechanism. Inventories, information on current status and basic biological information, such as data on animal populations and distribution, are scarce. The present organisation of national bodies currently responsible for national park management appears insufficient for proper execution of its tasks (e.g. Shibru Tedla and Kifle Lemma, 1998). Moreover, there is no body responsible for conservation of animal genetic resources and overall biodiversity conservation. In the context of highland-lowland interactions, research emphasising soil conservation and/or forestry research has been largely neglected.

#### *Natural resources and ecology*

**Furthering soil conservation efforts:** So far, the little research done on soils has emphasised soil fertility and has dealt primarily with trials and dissemination of artificial fertiliser. In Ethiopia and Eritrea, government-led soil conservation research in the 1980s aimed to test the usefulness of introduced technologies with respect to erosion control. Initially it did not include evaluation of traditional soil and water conservation activities in different agro-ecological zones. Many achievements were disrupted by the governmental decentralisation process after 1991. Research sites have been handed over to the newly formed Regional States, but some are not functioning smoothly for various reasons (e.g. SCRIP, 2000). Benefits to and contributions from rural communities in conservation and protection of in situ resources in the Horn countries need to be assessed. This will require identification of the species that are the primary focus of conservation by communities, and development of modalities by which benefits are shared and

responsibilities delegated to the appropriate stakeholders. Research must be done to foster the development of a soil loss model applicable to the Ethiopian highlands, using remote sensing and digital elevation models, with a view to assisting governments and NGOs in setting priorities for soil conservation. In order to monitor and model soil erosion processes, it will be necessary to assess erosion processes in relation to land management practices. A study to identify appropriate options under changing land use practices is also needed. Modelling will help to transfer knowledge gained to other similar areas without the need to collect the vast amount of primary data required.

**Improving water management in the highlands:** Water flow to downstream areas is decreasing, owing to increased use of available water in the highlands and diminished recharge of underground water as the result of increased flood flows caused by overgrazing, deforestation and expansion of cultivated areas. Moreover, unwise use of water resources worsens the situation. Hence it is probably necessary to consolidate freshwater resources to make them available to different stakeholders (e.g. Dessalegn Rahmato, 1999; MWR, 1999; Yacob Arsano, 2000; Zewde Abate, 1994). Research must be conducted to identify feasible options for reducing demand and consolidating freshwater availability, with a special focus on water abstraction in upstream areas that has negative impacts on availability of freshwater to down-stream users. Transnational river basins have often been a source of dispute and political tensions between countries. Cooperation, understanding and willingness among riparian countries are necessary if the water resources in these basins are to be used wisely, harmoniously and sustainably. Adequate studies have to be conducted, using joint resources and expertise, to identify the quantities, qualities and constraints in the basins concerned, with a view to developing appropriate, fair and mutually acceptable water management regimes.

**Increasing knowledge about resource availability in the lowlands:** In Ethiopia, research focusing on sustainable use of soils and soil conservation has not included lowland areas. Evaluation of rainfall and temperature variability in relation to cropping systems appears necessary with reference to agro-climatology and farming systems. Assessment of long-term rainfall and temperature patterns in these areas is necessary to develop suitable farming systems so that farmers will be able to adapt their practices to changing climatic patterns.



Fig. 15  
Soil conservation  
in semi-arid areas  
always involves  
water conserva-  
tion as well, and is  
a prerequisite for  
intensification and  
diversification of  
agriculture.

Photo:  
E. Ludi, 1997

**Exploring conservation opportunities in the lowlands:** In terms of resource conservation, the lowlands have been totally neglected. Pressured by the scarcity of water and feed resources for their animals, pastoralists often encroach on protected areas (e.g. Getachew Kassa, 2000; Markakis, 1993). In order to alleviate these and other related problems, it is proposed to initiate research on integrated conservation and development programmes in lowland areas used mainly by pastoralists. Appropriate mechanisms need to be identified and developed to ensure participatory management of natural resources in such areas.

Wind erosion is a serious problem in the pastoralist semi-arid lowlands. Wind breaks are needed for appropriate conservation. Investigations will be needed to determine how wind breaks can be established on the vast dry lowlands. On sedentary farms, the benefits of integrating trees into farms to control wind erosion are well known, and this practice should be further promoted. The contribution of compost in increasing the water retention capacity of soils in moisture-deficit areas is well recognised. However, the feasibility of such an exercise in this area will require studies at various locations.



### **6.5.2 Current research activities**

Currently, two main research themes are being explored in the Horn of Africa: Options for sustainable resource management and transformation of resource-related conflicts. Both themes were identified during the pre-synthesis workshop as very important and very urgent.

Conflicts at all levels, from inter-state to local, and related to various issues, were identified as a major obstacle to sustainable development in the Horn of Africa. Based on previous research carried out in the countries of the Horn, resource-related conflicts were identified as having a highly negative impact on the predominantly agrarian national economies on the one hand, and on the livelihood of stakeholders on the other hand. Two major research foci were selected: The first is concerned with resource and conflict management strategies in pastoral areas. The main objectives are to analyse how different stakeholders use and manage the natural resources on which their livelihoods depend. As natural resources have always been and continue to be contested under specific situations of stress, an analysis of existing conflict transformation strategies is also envisaged. Furthermore, formal and informal institutional regulations will be considered. Eventually, resource management strategies will be developed in cooperation with the stakeholders concerned. Existing conflict transformation mechanisms will be strengthened and enhanced – with insights gained elsewhere in terms of conflict management tools and approaches – and institutional reforms will be proposed, to allow stakeholders to manage natural resources sustainably without competition. The second research focus is on water management strategies in the Eastern Nile basin. It concentrates on the current interests and positions of the countries concerned, and the role played by international and national policies with regard to water development in local livelihoods, resource management and conflict management strategies. Irrigated agriculture, industrialisation and urban development, all highly water consumptive, are being promoted to foster economic development. Unbalanced and uncoordinated development projects in these areas can lead to disputes with other stakeholders over water. Thus a major research effort in this field will be to find ways to share water in an equitable manner between the countries, as well as between different sectors of the economy.

The Ethiopian highlands in particular have been densely populated and used for crop and animal production for generations. This long-term use of natural resources has led to severe resource degradation and constantly declining productivity, in combination with many other factors such as adverse land use policies, lack of alternatives to subsistence production for highland farmers, population growth and unchanged land management strategies and technologies. Research in this field addresses issues such as assessment of the impact of land degradation on overall development efforts in the Ethiopian highlands. Furthermore, more concerted efforts need to be made to develop sustainable land management strategies that do not further decrease the potential of these highland areas, as more than 80% of the Ethiopian population still depends on the highlands for survival.

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## 7 JACS Central Asia Facing the Problems of Transition towards Sustainable Development

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Fig. 1  
Mastering daily  
life in an  
impoverished  
economic  
situation has  
become a typical  
feature of rural  
livelihoods in the  
mountains of  
Central Asia.  
Photo: Ulrich Lutz,  
June 2000

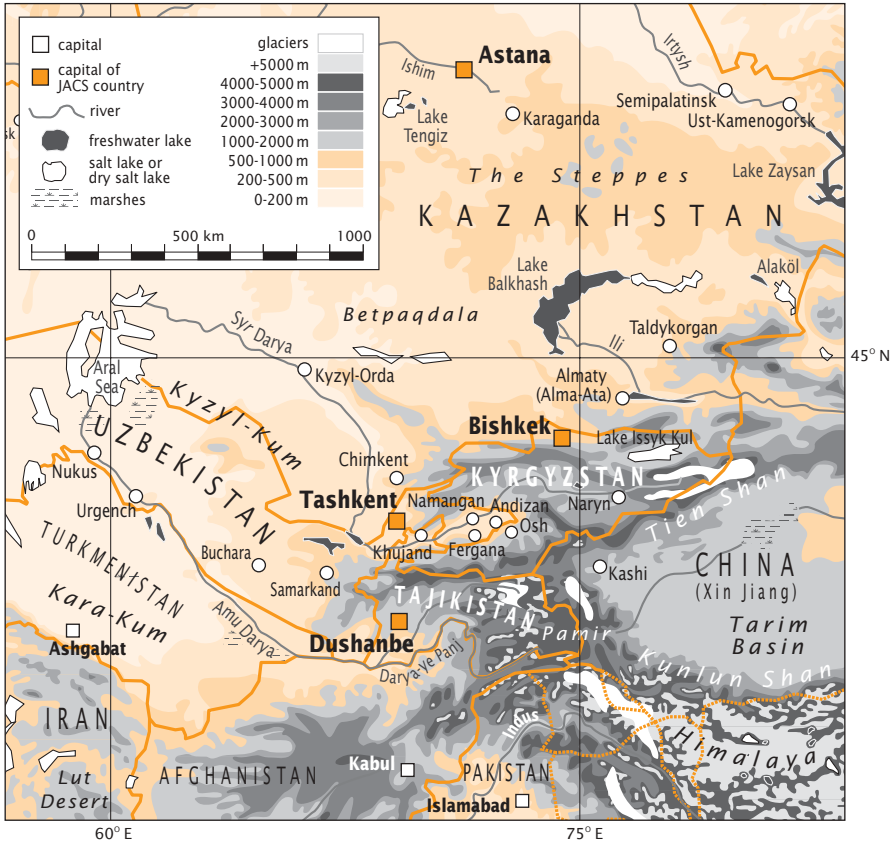


\* On behalf of all participants of the JACS Workshop held in Kashka-Suu, Kyrgyzstan, in July 2001 (listed in Annex 1, p. 449)



## **Abstract**

The transition of the Central Asian former Soviet republics of Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan to independent states in 1990 has presented their respective governments and societies with a challenge unprecedented in their recent history. Economic deregulation occurred on all levels; the Soviet subsidy system ceased to exist. Collective forms of agriculture were abandoned, leading to disintegrated individual survival practices under most difficult conditions and with multiple negative effects. Migration from rural areas to cities became a major strategy of the impoverished rural population, particularly the younger generation. These are but few of the many processes observed in Central Asia over the past 15 years. While Tajikistan and Kyrgyzstan are characterised by their predominantly mountainous territories, semi-arid to arid conditions prevail in Kazakhstan and Uzbekistan. In each of these general contexts a number of problems and threats occur in specific clusters that can be characterised as syndromes of global change and are typical for each respective syndrome context: the “mountainous”, the “semi-arid” and the “urban and peri-urban” or “intermediate”. From 9 to 11 July 2001 a workshop was held in Kashka-Suu, Kyrgyzstan, bringing together representatives from the four Central Asian countries in order to determine the core problems of the above-mentioned syndrome contexts and develop a mitigation research strategy. In the high-mountain context, core problems considered most important were weak institutions, inadequate policies, and prevailing conflicts, coupled with weak infrastructure, difficult bio-climatic conditions, high rates of unemployment and taxation burdens, jointly resulting in ex-migration and abandonment of the land. In the intermediate context, insufficient and inadequate governance, absence of the rule of law, a high share of informal economy, inadequate privatisation and a general collapse of infrastructure were considered most important. In the semi-arid context, key concerns were geopolitical instability in Central Asia, aged technologies, a decrease in social infrastructures, criminality, worsening human health and, above all, a wide array of processes of natural resource degradation.



*Fig. 2: The JACS Central Asia, comprising Kyrgyzstan, Tajikistan, Kazakhstan and Uzbekistan. Typical syndromes are observed for the highland-lowland, the semi-arid and the urban and peri-urban contexts, as well as their interfaces. Mitigation research should focus on highland-lowland interactions, the economically active intermediate zones, and conflicts and opportunities arising from the management of natural resources, particularly water. Regional development must be based on sustainable management of renewable natural resources.*

## 7.1 Introduction to the JACS Central Asia

Central Asia is most commonly defined as the territory of the 5 newly independent states of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. While geographers in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries defined Central Asia as a vast inland area of internal Asia (Xin Jiang), Fairbanks et al. (2000) used the broader term of “Central Eurasia”, including not only the 5 above-mentioned states, but also the 3 Caucasian states of Azerbaijan, Armenia and Georgia, as well as northern Iran, Afghanistan, northern Pakistan and Xin Jiang Uigur Autonomous Province (UAP) of China. The present report, however, is mainly concerned with the territory of the 4 former Soviet republics of Kyrgyzstan, Tajikistan, Kazakhstan and Uzbekistan (Fig. 2), defined within the NCCR North-South as the Joint Area of Case Studies (JACS) Central Asia.

According to ADB (2001), the JACS Central Asia covers an area of more than 3.5 million km<sup>2</sup> and stretches from Mongolia in the east to the Caspian Sea in the west; from the Altai mountain range and Siberia in the north to the Karakorum and the Hindukush in the south. In terms of ecology, the region is characterised by different variations and combinations of desert, steppe and mountain ecosystems. The Pamir, Pamir-Altai, Tien Shan, Altai and other mountain ranges cover 15% of the JACS Central Asia and function as water towers for the adjacent semi-arid to arid lowlands. Central Asia is one of the largest inland areas of the world, from which the rivers do not flow into oceans; only the Black Irtysh River, being a tributary of the Ob Basin, carries its waters to the Arctic Ocean.

In 2000 there were about 51 million people living in the region of the JACS Central Asia, including ethnic groups such as Uzbeks, Kazakhs, Russians, Tajiks, Kyrgyz and many others (Table 1). Historically, the territory of Central Asia has always been an arena for opposing external forces: Greeks and Parthians, Arabs, Jourjenes, and Huns. Starting from the 18<sup>th</sup> century, but especially in the 19<sup>th</sup> and early 20<sup>th</sup> centuries, Central Asia was an object of rivalry between the British and Russian empires in their competition for greater spheres of influence. Under the Soviet regime, finally, Tajikistan was chosen to demonstrate to the “indigenous peoples of Asia” the advantages of the Soviet economic, political and social doctrines of transformation from a feudal province of Eastern Turkestan into a developed agro-industrial country (Fersman, 1933).

Table 1

Country	Area in 1,000 km <sup>2</sup> (mountain area as percentage of total area <sup>2)</sup> )		Population in million (in 2000 <sup>3)</sup> )	Ethnic composition (in %)
Kazakhstan	2,725	(6%)	16.2	Kazakhs (46.0), Russians (34.7), Ukrainians (4.9), Germans (3.1), Uzbeks (2.3), Tatars (1.9), others (7.1)
Kyrgyzstan	200	(94%)	4.9	Kyrgyz (52.4), Russians (18.0), Uzbeks (12.9), others (16.7)
Tajikistan	143	(93%)	6.1	Tajiks (64.9), Uzbeks (25.0), Russians (3.5), others (6.6)
Uzbekistan	447	(10%)	24.9	Uzbeks (80.0), Russians (5.5), Tajiks (5.0), Kazakhs (4.0), Karakalpaks (2.5), Tatars (1.5), others (1.5)
Total	3,507	(15%)	52.1	

Area, % of mountain area, population and ethnic composition of the countries of the JACS Central Asia.<sup>1)</sup>

Sources:

<sup>1)</sup> ADB, 2001

<sup>2)</sup> RGA, 2000

<sup>3)</sup> UNDP, 2002

The waves of various civilisations that rolled over the territory of Central Asia from east to west have significantly influenced the region's ethnic and cultural heritage: the Chinese brought the culture of silk production, Greek and Parthian peoples introduced elements of antique culture that influenced city construction and art development in the region, and Russia imported the agricultural practice of potato growing. Over the ages, an unusual civilisation has developed in the ethnic-cultural basin of Central Asia, combining elements of both nomadic and settled cultures, including irrigation agriculture.

While the Great Silk Road has always connected Mediterranean and Oriental civilisations, today, under the conditions of globalisation, a new version of this connection is being constructed in the form of powerful transport corridors from east to west (Transeco Project, the railway from the Fergana Valley to Urumchi and Chinese ports on the eastern coast) and from north to south ("Transcontinental Eurasian Bridge" from Xin Jiang UAP to eastern Siberia) (Liu Jian Fu and Gu Jia Yu, 2001).

Table 2

Some key indicators for the countries in the JACS Central Asia.

	Year	Kazakhstan	Kyrgyzstan	Tajikistan	Uzbekistan
<b>Geography and social indicators</b>					
Surface (thousand sq. km)	2000	2,725	200	143	447
Total population (million)	2000	16.2	4.9	6.1	24.9
Annual population growth rate (%)	1990–2000	-0.9	1.2	1.8	1.8
Urban population (% of total population)	2000	56	33	28	37
Annual urban growth rate (%)	1990–1995	1.2	1.1	2.1	2.6
<b>Development and economic indicators</b>					
GDP per capita, at purchasing power parities (USD)	2000	5,871	2,711	1,152	2,441
HDI rank (total 173)	2002	79	102	112	95
Human Poverty Index (% of population below poverty line)	1989–2000	34.6	51	–	–
Population in agriculture male / female (% of labour force)	1998–2000	–	52/53	–	–
Public expenditure on education / health (% of total public expenditure)	1995–1997/1998	4.4/ 2.7	5.3/ 2.2	2.2/ 5.2	7.7/ 3.4
Population with access to safe water / adequate sanitation (%)	2000	91/ 99	77/ 100	–/–	85/ 100
<b>Environmental indicators</b>					
Crop land per capita (hectares)	1997–1999	1.99	0.28	0.12	0.19
Area of severe soil degradation (% of country)	2000	17	2	7	13
Protected area (% of total surface)	1999	2.7	3.6	4.2	2
Energy consumption per capita (kilogram of oil equivalent)	1999	2,374	504	543	2,024

Sources:

UNDP, 2002;  
World Bank,  
2002a+b;  
FAO, 2000

The modern geopolitical landscape of Central Asia is shaped by the following factors (cf. Hurni et al., 2003):

- the collapse of the USSR, inducing widespread poverty in the newly independent states of Central Asia;
- the neighbourhood with Afghanistan and related problems such as conflicts, terrorism and drug business;
- demographic and economic pressure from China owing to its new doctrine of priority development of its western provinces (above all Xin Jiang UAP);
- the availability and accessibility of energy resources (oil, gas) in Turkmenistan and Kazakhstan, offering opportunities for transnational corporations;
- uneven distribution of water resources in the region, creating a disparity between Tajikistan and Kyrgyzstan as water suppliers, and Uzbekistan, Kazakhstan and Turkmenistan as the main users of this precarious resource.

In the 20<sup>th</sup> century, the states of Central Asia were part of the superpower USSR. Now, however, they appear to be dissociated and show a tendency towards disintegrated rather than integrated development, despite the multiple agreements and the unions they have formed, such as the Central Asia Economic Union or the Eurasian Economic Union. The process of shaping a new geopolitical and economic landscape is complicated and has only rarely been studied to date. Globalisation and increasing difficulties with the mechanisms of access to the region's resources have further complicated its spatial and functional structures, as well as its statistical indicators (cf. Table 2).

## 7.2 Selection and justification of core problems

The identification of “core problems” in Central Asia was an important component of the Kashka-Suu Workshop. In a first input session, core problems were defined as elements of “syndromes”, which were understood as typical clusters of core problems that share the negative quality of generating “unhealthy conditions in an organism” (cf. WBGU, 1996). A “syndrome context” was then defined as a typical ecological, social, economic and political setting in which an actual or potential syndrome would occur. These definitions served as a basis for the methodology used to identify and select core problems. The task of outlining syndrome contexts proved rather complicated due to considerable differences within the region; nevertheless, the participants decided to characterise 3 main syndrome contexts and use them as a basis for further work.

### 7.2.1 Three main syndrome contexts in Central Asia

The first syndrome context consists of **mountain** locations with characteristically extensive agriculture (e.g. pastoral stock-breeding), low settlement density and poor infrastructure. High mountains share the common problem of pronounced altitudinal stratification and difficult highland-lowland interactions (cf. Hurni and Wiesmann, 2002). Rainfed or irrigated agriculture is practiced up to about 3000 m a.s.l.; alpine grazing extends to about 5000 m a.s.l., which is near the snow line. Considerable variations in the natural environment and economic development of this large region may necessitate further differentiation of this syndrome context.

The second syndrome context consists of fairly intensely developing **intermediate** settings located along foothills and in the lowlands. These regions are characterised by high settlement density, a high level of urbanisation and a dense infrastructure network, as well as a more diversified and more intensive peri-urban economy. This context includes locations (e.g. oases) with the most favourable bio-climatic conditions for human life and economic activities in Central Asia. Nevertheless, these regions also have core problems that may lead to a syndrome.



Fig. 3  
Summer pasturing  
is practiced at high  
altitudes in the  
Tajik Pamir.  
After collective  
use during Soviet  
times, this is now  
again a household-  
centred activity.  
Photo: Hans Hurni,  
June 2000



Fig. 4  
Most economic  
activities are  
concentrated in  
centres in the  
intermediate zone  
between the  
mountain ranges  
and lowlands of  
Central Asia.  
Photo: Brigitte  
Portner, July 2001



The third syndrome context consists of **semi-arid** regions in the lowland plains of Central Asia, including desert, semi-desert and steppe locations. Problems of irrigated agriculture relate back to the highland-lowland and high-mountain contexts due to the dependency on water. Land degradation is widespread as a result of salinisation, misuse of water, industrial contamination and desertification of grazing land.

Fig. 5  
Irrigation is of vital economic importance in the semi-arid zones of Central Asia, provided that infrastructure is maintained. Photo: Brigitte Portner, July 2001



### 7.2.2 Methodology of core problem identification and justification

Participants at the Kashka-Suu Workshop then divided into 3 groups for a brainstorming session in which each group listed potential core problems for one specific syndrome context. In each group, core problems were structured according to 5 scientific realms: (1) political and institutional issues, (2) socio-cultural and economic issues, (3) issues regarding population and livelihoods, (4) infrastructure and land use issues, and (5) bio-physical and ecological issues. A set of core problems was then identified for each of the 3 syndrome contexts (SPSP, 2002). A weighting of each of the core problems by its relevance made it possible for participants to differentiate among the listed core problems and sometimes also between sub-contexts, e.g. between mountain situations in the different countries or between different land and resource use systems within a specific context. Tables 9–11 (pp. 209–215) present the results of this weighting for each syndrome context.

In a next step, new working groups were formed according to the 5 scientific realms. These groups were given the task of harmonising the various sets of core problems in each scientific realm. The result of this step is presented in Table 3.

Table 3

Realms	Core problems for all syndrome contexts in the JACS Central Asia	Common core problems observed in different syndrome contexts in Central Asia, as identified by workshop participants (SPSP, 2002).
Political & institutional	1. Prevalence of conflicts and conflict-generating factors	
	2. Inappropriate and non-transparent state governance	
	3. Ineffective and inappropriate regional institutional structure	
	4. Improper legal framework and enforcement of laws	
	5. Geopolitical instability in the greater region	
	6. Limited human rights	
Socio-cultural & economic	7. General atmosphere that discourages investment	
	8. Disadvantageous geographical position with respect to transport infrastructure	
	9. Insufficient capacity for the use of advanced technologies	
	10. Uncompetitiveness of economy in a globalised context	
	11. Unsatisfactory results of privatisation and a large-scale shadow economy	
	12. Increasing unemployment and professional migration	
	13. Poor tax base and high local budget deficits	
	14. Technologies poorly oriented towards processing and marketing	
	15. Collapse of social and cultural infrastructure	
	16. Deficit of available energy resources	
Population & livelihoods	17. Increasing poverty, unemployment and social depression	
	18. Spreading of diseases, drug addiction and prostitution	
	19. Growing together of cities	
	20. Increasing migration (internal and external)	
	21. High birth rate and gender inequality	
Infrastructure & land use	22. Decline of infrastructure	
	23. Poor land use management and local involvement	
	24. Limited access to natural and land resources	
	25. Loss of traditional skills in resource management by local communities	
Bio-physical & ecological	26. Soil degradation	
	27. Water resource degradation	
	28. Degradation of vegetation	
	29. Loss of non-renewable natural resources	
	30. Poaching and forced migration of wild animals into limited habitats	
	31. Increase of natural disasters	
	32. Contamination of all types of natural habitats, waste accumulation	

## 7.3 Status and dynamics of core problems

### 7.3.1 Core problems in the political and institutional realm, and attempts to resolve them

The main problems of the Central Asian region in the field of political and institutional development as perceived by the participants of the workshop are listed in Box 1. This list includes problems from all syndrome contexts. The common historical fate of the states of Central Asia has led to a relative homogeneity of problems in the region at the turn of the millennium. The region's transition to a system of sovereign states requires fundamental changes in the constitutional system and in the entire political superstructure (Koichuev, 1997; Rumer and Zhukov, 1998). This transformation has affected the state system mainly through numerous regulations and legal acts that were derived from outside the region and initiated at the central level, but are now subject to constant change and amendment (Kubaev, 1998).

#### **Box 1: Core problems in the political and institutional realm**

1. Prevalence of conflicts and conflict-generating factors
2. Inappropriate and non-transparent state governance
3. Ineffective and inappropriate regional institutional structure
4. Improper legal framework and enforcement of laws
5. Geopolitical instability in the greater region
6. Limited human rights

A constituent part of the process of democratic transformation (Koshanov et al., 1997), decentralisation is going very slowly despite the fact that institutions of local government in Central Asia had been in place long before the Soviet power was set up. The authoritarian regime and centralised economy of the Soviet period substituted previous forms of agriculture in local communities and their informal authorities; local communities were practically excluded from the governing system even within their local contexts. Even today, the legal basis for the process of decentralisation depends directly on decisions made at the central level. Reforms cannot be transferred to the lower levels without first being settled at the central level. This is why the solution of social and other questions on site is postponed as well.

Contradictory policies are noted in practically all sectors and aspects of public activity. The situation is further aggravated by inappropriate institutional

structures of power and administration, as well as by specific defects in workforce policy. Numerous unsettled questions of regional and interregional nature account for Central Asia's current geopolitical instability. Ethnic and religious conflicts all have a political aspect. Particularly enclave territories along the boundaries of the newly independent states, e.g. in Fergana Valley, provoke conflicts (Lubin and Rubin, 1999). Causes for the above-mentioned core problems are found in absent or inappropriate state regional policies and development strategies, as well as in the ineffectiveness of state governing systems.

The idea of integrity of the Central Asian region has resulted in the establishment of various forms of interregional cooperation, including political, military, economic, ethnic-cultural and ecological frameworks (cf. Tabyshalieva, 2000). They are all intended to facilitate sustainable development in the region, based on the sustainable use of available resources. The main guiding principles are: (a) balanced use of available water in the arid climatic conditions, including equitable use of transboundary waters and the conservation of the Aral Sea basin; (b) prevention of military, ethnic and religious conflicts; (c) to fight against weapon smuggling and drug transit. Other issues of concern are the improvement of transport and communication between the states of the region, mutually profitable customs and tax regulations, improvement of cross-border trade and free travelling of people across borders.

Good examples for attempts to solve real problems through joint efforts in this realm are the foundation of the Central Asian Union in January 1994, the establishment of the Central Asian Bank of Cooperation and Development, as well as a number of concrete projects of joint interest financed through this Bank. Despite such examples, the movement of the Central Asian states towards integration is rather insignificant on the whole. Like in the CIS, a great number of general documents are adopted, while only a small number of documents specifically address tariff and non-tariff regulations, unification of the tax law, or the elimination of various bureaucratic barriers for the free movement of people, goods and services.

One significant factor that may positively affect the process of integration is the attempt to diminish external influences on the Central Asian countries. However, the economic instability in the neighbouring states scares each country away from the other. The water distribution situation can be considered as an example. There are abundant water resources available in Kyr-

gызстан, and in winter when there is a shortage of fuel and gas it is quite logical to increase the water discharge at power stations to generate more power. However, this contradicts the interests of the neighbouring states and particularly of Uzbekistan, as water discharge in winter causes flooding and results in a shortage of irrigation water for agriculture in spring and summer. Efforts to settle these questions are being undertaken. For example, in 1999 Kyrgyzstan, Kazakhstan and Uzbekistan signed an agreement on cooperation in the use of water resources.

Within regional cooperation, special attention is given to the problem of natural resource management and preservation of the environment, based on the idea of jointly addressing ecological issues in Central Asia (UNEP, 2000a and b). The glaciers of the Tien Shan and Pamir mountains are diminishing, causing a decrease in river runoff and a reduction of freshwater resources. In the intermediate zones of the catchments water is conserved by mountain forests; however, this vegetation is also being degraded. Joint efforts aimed at the conservation of biodiversity of individual areas of the region work towards an integrated approach and a collective solution of ecological problems.

One of the first attempts made by the Central Asian states to overcome the region's general ecological problems was the agreement on joint activities for the settlement of the Aral Sea crisis, which was signed in March 1993. During a second summit of the leaders of the Central Asian countries, the International Fund for Saving the Aral Sea was established, to which each of the Central Asian countries was supposed to contribute 1 % of its GDP. At the same time, a programme of concrete actions to improve the environment around the Aral Sea was defined for the next 3–5 years, taking into account the socio-economic development of the region. The settlement of the Aral Sea problem was believed to require the coordination of activities between the interested states at the intergovernmental level, changes in the policies of these states regarding the use of water resources, and the unification of large funds. However, the states involved have failed to fulfil these 3 conditions; in consequence, the desired results have not been achieved. This example is indicative and confirms the disability of the Central Asian states to undertake collective action towards overcoming joint problems.

Along with that, the complicated transition to a market economy does not allow to fully implement objectives and tasks planned at the interstate level. One reason for this are the multiple internal problems in each of the states,

the settlement of which cannot be postponed. The other reason for the current situation is unsatisfactory interaction between partners at the horizontal (executive) level, i.e. between institutions. This leads to flaws in the legal framework for cooperation, as well as failure to observe, or sometimes neglect of, obligations.

In conclusion, regional cooperation in Central Asia is affected by 3 main factors. One of them is the deeply and historically rooted heterogeneity, based on the territorial, cultural, ethnic, lingual and religious diversity of the community of peoples and states that formed here long before Mongolian times and has managed to retain its identity and ties of integration while and after joining the Russian empire, and later the Soviet Union. The second factor is the inheritance of the Soviet Union, which still influences integration processes between the member states of the CIS. The third factor is of a global nature and is related to the integration of the region with the political system and economy of the globalised world.

Furthermore, as a result of diverging economic interests and the problems they cause in the relationships between the states of the region, these states exhibit an apparent difficulty to resolve socio-economic and ecological contradictions due to existing territorial claims, influence from the Islamic factor (Hanks, 1999), the international terrorism and drug business, or the unfavourable development of the military situation in Afghanistan in 2001, by use of internal capacity and competence.

### **7.3.2 Core problems in the socio-cultural and economic realm**

The core problems identified by workshop participants in the socio-cultural and economic realm for the 3 syndrome contexts are listed in Box 2. The economic crisis that affected all Central Asian republics after the collapse of the Soviet Union had severe consequences that are still felt (Volgina et al., 2001). However, after the years of conflict in the 1990s, during which the crisis was aggravated, there now appears to be some macroeconomic stability (Table 4). Industrial stagnation in the 1990s had its primary cause in the collapse of production and disintegration of technological ties among economic units, in the problems of insolvency and in loss of access to raw material and sales markets. The subsequent processes of privatisation and decentralisation did not yield the intended results: property was distributed in an inappropriate manner, and the attempt to reanimate the economy failed. The equity market did not develop properly either. For remote high-mountain

territories with economies based on agriculture, agricultural reforms were more important; however, “forced” decollectivisation left farmers with nothing to base their livelihoods on. The situation was further aggravated after the Central Asian countries left the “rouble zone”, introduced their own national currencies, liberalised prices and established custom barriers. The economic decline was also associated with the increase in unemployment and the high level of inflation throughout the region. To some extent the effects of this “shock therapy” were mitigated by financial aid from international financial organisations; however, the negative influence of economic globalisation remained deterministic (cf. Koichumanov, 2000). In addition, the external debts of the Central Asian states grew from year to year, and there was not enough direct investment.

**Box 2: Core problems in the socio-cultural and economic realm**

1. General atmosphere that discourages investment
2. Disadvantageous geographical position with respect to transport infrastructure
3. Insufficient capacity for the use of advanced technologies
4. Uncompetitiveness of economy in a globalised context
5. Unsatisfactory results of privatisation and a large-scale shadow economy
6. Increasing unemployment and professional migration
7. Poor tax base and high local budget deficits
8. Technologies poorly oriented towards processing and marketing
9. Collapse of social and cultural infrastructure
10. Deficit of available energy resources

Table 4

Dynamics of GDP, based on constant prices (1991 = 100).		1991	1996	1997	1998	1999	2000
	Tajikistan	100.0	34.0	34.0	36.0	38.0	41.0
	Kyrgyzstan	100.0	58.9	64.7	66.1	68.5	72.0
	Kazakhstan	100.0	69.3	70.5	69.2	71.0	77.9
	Uzbekistan	100.0	83.0	87.3	91.1	95.2	99.0
Source:	For comparison:						
CIS Interstate	Australia	100.0	121.4	126.1	132.6	138.4	143.8
Statistical	Austria	100.0	108.1	109.4	112.6	115.1	118.5
Committee, 2001	Brazil	100.0	119.2	123.0	123.3	124.3	(no data)

The unfavourable continental position of the Central Asian countries and the related transport problems are considered factors with a negative influence on the development of this large territory. The Central Asian economies are non-competitive and deprived of new technologies. At the same time they are experiencing growth of the “shadow” sector on the one hand, and of the tax burden on the other hand. The state monopolies are not intended to share surplus profit. There is no basis for accumulation and savings; as a result there is a lack of investment. In addition, criminality and corruption are on the increase.

Society itself tends towards stratification: social strata of poor and of wealthy people have formed. Unemployment is growing, and the majority of the population, particularly the rural population, has lost access to its former socio-cultural assets. This is related to the collapse of social infrastructure and insufficient financing of this sector. The financing of science leaves much to be desired. The inflation in tariffs for social services and utilities, as well as the introduction of paid services, are not sufficiently compensated by indexation of wages and other social payments. The livelihoods of the mountain population are additionally complicated by their limited access to energy resources and the low potential of agro-climatic resources in the mountains, which restrict their opportunities of producing sufficient income and/or food.

Against this socio-economic background, the chronic deficits and imbalances in the state budgets appear logical. Within the system of local budgets, the funds for local communities sank into oblivion; this process is further supported by the non-transparency of the budgeting process (Keshikbaev, 2000). The financial potential of municipalities does not comply with the functions and authority entrusted to them by higher-level bodies with regard to public services, development of territories, social environment, social security, preservation of the environment and other main aspects of public activity.

### **7.3.3 Core problems related to population and livelihoods**

Against the general background of an extremely uneven distribution of the population throughout the region, the most obvious differentiation in terms of population is between mountain regions and valleys or lowlands (cf. Gorbunov and Koichumanov, 1989). The vast intermontane basin of the Fergana Valley is one of Asia’s most densely populated regions. It is inhabited by a



wide range of national minorities starting from descendants of ancient nomads and farmers to migrants of the last colonial period and displaced peoples. These various ethnic groups were further diluted by various religious trends. Due to their isolation, some remote mountain communities have developed a typical and distinct culture, tradition and everyday life. The above-mentioned facts, along with a complicated socio-economic situation in the region, have led to a critical vulnerability of the region to different types of conflicts.

**Box 3: Core problems related to population and livelihoods**

1. Increasing poverty, unemployment and social depression
2. Spreading of diseases, drug addiction and prostitution
3. Growing together of cities
4. Increasing migration (internal and external)
5. High birth rate and gender inequality

In the hyperinflation of the early 1990s and the financial collapse of the banking system, the population lost all their savings; this was the beginning of all difficulties of the transitional period. In search of a better life, part of the population has migrated to neighbouring countries or left the region altogether.

Against the background of growing unemployment, external migration has also induced active internal migration. As a result, cities are overpopulated and infrastructure development cannot keep up with the needs, while the villages are drained of working-age inhabitants and left with mostly old people. This situation is typical particularly for remote semi-arid (Glazovsky and Shestakov, 2000) and mountain regions, where low income and living standards have caused the most pronounced outflow of working population. Cities and agglomerations with their flourishing services trade and high turnover rates offer new economic possibilities to villagers that are forced to leave their rural homes in search of a livelihood. However, rural-urban migration leads to extremely acute social problems in the cities, including increasingly widespread drug addiction and prostitution. At the same time, survival mechanisms induced by the market environment spontaneously – though at times painfully – settle the problems of gender inequality, which is one of the pillars of patriarchy.

Table 5

		Number of births		Number of deaths		Natural growth		Birth rate, death rate and natural population growth.
		in 1,000	in %	in 1,000	in %	in 1,000	in %	
Kazakhstan	1991	354	2.16	135	0.82	219	1.34	Source: CIS Interstate Statistical Committee, 2001
	1999	212	1.42	146	0.98	66	0.44	
Kyrgyzstan	1991	130	2.85	31	0.69	99	2.16	
	1999	104	2.14	33	0.68	71	1.46	
Tajikistan	1991	213	3.89	33	0.61	180	3.28	
	1999	114	1.86	26	0.42	88	1.44	
Uzbekistan	1991	723	3.45	130	0.62	593	2.83	
	1999	545	2.23	131	0.53	414	1.70	

Table 6

		Total population, in millions	Specific weight of age groups within the total population, in %			Age groups of the population.
			0–14	15–64	65 & older	
Kazakhstan	1989	16.990	32	62	6	Source: CIS Interstate Statistical Committee, 2001
	2001	14.844	29	64	7	
Kyrgyzstan	1989	4.258	37	58	5	
	2001	4.908	35	59	6	
Tajikistan	1989	5.093	43	53	4	
	2001	6.196	42	54	4	
Uzbekistan	1989	19.810	41	55	4	
	2001	24.900	38	58	4	

Generally, in the Central Asian region the rate of demographic growth does not comply with the low rate of economic growth (Tables 5 and 6). For example, between 1967 and 1986 the rural population grew by a factor of 2.1 (Glazovsky and Shestakov, 2000).

### 7.3.4 Core problems related to infrastructure and land use

In connection with the relative shortage of freshwater in parts of the region, Central Asia faces an acute shortage of drinking water, particularly in mountainous and semi-arid areas. Water supply systems exist in practically all settlements; however, there is a lack of finances for repair, operation and maintenance. With regard to irrigation water, the situation is quite similar: the distribution networks are not properly maintained, leading to a loss of water in irrigation networks. The situation is also the same with regard to power supply, telecommunication and transport systems. Thus, practically all support services have fallen into decay. While these sectors are somehow supported at the national and regional levels, the problems remain unsettled at the level of local communities, that are, after all, the main consumers of the services.

#### **Box 4: Core problems related to infrastructure and land use**

1. Decline of infrastructure
2. Poor land use management and local involvement
3. Limited access to natural and land resources
4. Loss of traditional skills in resource management by local communities

The collapse and decay of infrastructure is connected with the general economic crisis in the region. This is especially obvious at the lower levels, i.e. within the settlements and local communities, which is a direct consequence of the previous centralised state system. Insufficient and scarce infrastructure in mountain and semi-arid territories literally and figuratively alienates these areas from economically more developed regions and restricts their access to the market. Within the land and resource use system at the local level there are no concrete plans or strategies. The transfer of poor infrastructure to the property of municipalities, along with financial support for its operation and maintenance, is one of the main options for reform. In this respect, the reform of the health sector will be of particular relevance (Klugman and Schieber, 1997).

Land use problems are particularly acute due to the economic crisis that has mainly affected high-mountain and semi-arid territories. Large areas of pasture and arable land are under-used, while in the zones of intensive development there is a fight for land and housing plots. In arid regions, previously

valuable arable land had to be given up due to water logging, salinisation and alkalinity. Agricultural land is being degraded throughout the region. The situation is no better in forest areas: forests are increasingly under pressure as their functions are expanded. This includes active industrial deforestation, development of tourism and recreational activities, forced wood-cutting by the local population, as well as harvesting of wild berries, fruit, herbs and other forest products.

### 7.3.5 Core problems in the bio-physical and ecological realm

Due to the fragile dynamic balance within their ecosystems, mountainous and semi-arid environments are particularly vulnerable to the growing danger of ecological changes caused by human interference. Exploitative methods of resource use and development aggravate the ecological situation in the Central Asian region – a situation typical for transition economies (cf. Gov. of Kazakhstan, 1999; Gov. of the Kyrgyz Republic, 1998a, 1999; Gov. of Tajikistan, 2000). A case in point is the development of large-scale irrigation systems in the Aral Sea basin since the 1950s. Table 7 shows that while the population nearly tripled in the past 40 years, irrigated lands and water use increased only by a factor of 1.75 and 1.6 respectively. In the same period, the amount of water available per ha and per capita dropped considerably, not to speak of the disastrous environmental situation of the Aral Sea itself. The positive aspect of this irrigation development is the growth of the region's GDP by a factor of 4 in 40 years.

#### Box 5: Core problems in the bio-physical and ecological realm

1. Soil degradation
2. Water resource degradation
3. Degradation of vegetation
4. Loss of non-renewable natural resources
5. Poaching and forced migration of wild animals into limited habitats
6. Increase of natural disasters
7. Contamination of all types of natural habitats, waste accumulation

Table 7

Dynamics of population, water yield and irrigation in the Aral Sea basin.		Indicator	Measuring units	1960	1970	1980	1990	1999
		Population in Aral Sea basin	million	14.1	20.0	26.8	33.6	39.9
		Irrigated lands in the basin	million ha	4.51	5.15	6.92	7.60	7.89
		Total water used in the basin	km <sup>3</sup> per year	60.61	94.56	120.69	116.27	100.87
		Irrigation component	km <sup>3</sup> per year	56.15	86.84	106.79	106.40	90.30
		Specific water yield per ha	m <sup>3</sup> per year	12,450	16,860	15,430	14,000	11,445
Source:		Specific water yield per capita	m <sup>3</sup> per year	4,270	4,730	4,500	3,460	2,530
SCICWC, 2000		GDP (non-adjusted)	Billion USD	16.1	32.4	48.1	74.0	54.0

Further ecological core problems in Central Asia are related to pressure on vegetation and wildlife. On the positive side, there is a considerable number of previously established natural conservation areas in the region with highly diverse levels of protection. In Kazakhstan, the so-called National Reserved Area (NRA) covers 2.8% of the republic's total territory or about 76,000 km<sup>2</sup>. In addition, vast territories of military grounds closed for any economic activity present a large reserve of partially undisturbed steppe ecosystems. In Kyrgyzstan, the NRA encompasses a total area of 7,773 km<sup>2</sup>, or 3.9% of the republic's territory; however, these areas do not cover all main ecosystems and do not include all bio-geographic zones of the country (cf. Gov. of the Kyrgyz Republic, 1998b). In Tajikistan an entire network of reserved natural territories covers practically all natural landscape complexes of the country and accounts for about 30% of the republic, or about 40,000 km<sup>2</sup>; their efficiency and status of functioning, however, is at an extremely low level. Anthropogenic influence on biodiversity in Tajikistan is continuously increasing, and in many areas the degradation of natural landscapes has reached an irreversible state, particularly when soil degradation is involved: soil degradation undermines the natural potential for the current climax vegetation and wildlife habitat. An increase in poaching is causing forced migration and diminishing populations of wild animals. Species that live in very limited habitats, such as the snow leopard, are particularly threatened (Dexel, 2000).

Soil degradation in Central Asia is the result of irrigation mismanagement on the one hand, and rainfed agriculture on slopes without protective measures and appropriate land use on the other hand. Salinisation, alkalinisation and contamination with industrial waste and agricultural inputs are pronounced in virtually all irrigation areas at lower altitudes (Peltz, 2000). Soil erosion, in turn, has led to widespread soil degradation particularly on rainfed cultivation land on slopes in the western half of Tajikistan. Remediation is possible in a majority of the observed cases, although a considerable portion of all agricultural lands is at a point of irreversible destruction, thus diminishing the region's potential productivity.

Finally, environmental problems exist in virtually all industrial complexes and in connection with mining activities. Large-scale existence of deposits of radio-active waste as a heritage from the Soviet nuclear programme is assumed and has been partly verified. Contamination of groundwater, lakes and rivers is widespread and only insufficiently tackled. Malfunctioning irrigation systems cause soil degradation, which is aggravated by increased salinisation due to high evaporation rates and to the almost unavoidable extinction of the Aral Sea in the medium term.

Socio-economic depression and chronic budget deficits do not allow the Central Asian states to consider the solution of ecological problems a priority. The efforts of the Regional Ecological Centre (REC) in Almaty, Kazakhstan, are not sufficiently supported by the national structures. The persistent narrow character of institutional structures sets up barriers at all levels of power. This and many other problems are due to the weak institutional basis of activities to preserve the environment, primarily within the respective individual states of Central Asia.

## 7.4 Synopsis and syndrome contexts

### 7.4.1 Synopsis of core problems

During the elaboration of the synopsis of core problems in all 3 syndrome contexts as shown in Table 3 (p. 193) it became apparent that within the different scientific realms the core problems have much in common. Core problems were weighted for each syndrome context, using a scale from 1 to 7, with 1 indicating insignificance, and 7 extreme importance on a “global” scale. The synopsis in Table 8 shows the average score of all core problems in each respective scientific realm and each of the 3 syndrome contexts. Scores vary between 3.9 and 6.0, resulting in an average around 5 in most cases. This shows that for each syndrome context serious core problems exist in each scientific realm, from the bio-physical to the political, which in turn indicates that a syndrome actually exists in each of the 3 syndrome contexts in Central Asia.

Table 8

Average weighting score of core problems by syndrome context.	Scientific realm	Mountain	Inter-mediate	Semi-arid	All contexts
Source:	Political and institutional	4.8	5.7	4.0	4.5
Average data from Tables 9, 10 and 11	Socio-cultural and economic	5.1	5.4	6.0	5.3
	Population and livelihoods	5.0	4.7	5.5	5.2
	Infrastructure and land use	4.6	5.0	4.1	4.4
	Bio-physical and ecological	3.9	4.5	5.6	5.0
	Average by context	4.8	5.0	5.1	4.9

As can be seen in Table 8, for the political and institutional realm the average score of all core problems listed in Tables 9–11 below is 4.5, with the most urgent need for mitigation being in the intermediate context, in which most development activities occur. When addressing possible mitigation measures to overcome core problems, participants underlined the necessity of strengthening decentralisation processes, transparency of state administration, law fulfilment and democratic institutions. In the socio-cultural and economic sphere, the average score is 5.3, with a relatively high disparity between the different syndrome contexts. In the realm of population and livelihoods, the average score is 5.2, indicating equally high importance as

in the socio-economic realm. Here, the need for mitigation is more pronounced in mountains and semi-arid situations than in the intermediate context. The realm of infrastructure and land use was assigned least importance by the participants; nevertheless, the average score is still at 4.4. The fact that the average is highest in the intermediate context indicates that degradation due to pressure on the land is most pronounced there, while infrastructure needs are highest due to the high population densities. The bio-physical and ecological realm has an average score of 5.0, with the highest need for mitigation in semi-arid contexts.

#### **7.4.2 High mountain and highland-lowland syndrome context**

Mountains in Central Asia present an economic potential as pasture territories and water towers, as well as for tourism and mining. Furthermore, their biodiversity is of global value. The specific highland-lowland system in Central Asia is determined by the region's inland continental location, with the Tien Shan and Pamir mountain ranges in the centre and large steppe and desert areas around the Aral and Caspian Seas.

Historically, a division of labour emerged between settled farmers on the plains and in oases practicing irrigated agriculture, handicrafts and commerce, and nomad stockbreeders predominating on pasturelands in semi-arid plains and on mountain pastures. Steppe nomads depended on seasonal migration over fairly long distances along the meridians with their animals, while mountain nomads took advantage of the compact distribution of seasonal pastures over the vertical zones of mountain slopes. Winter camps, the procurement of animal fodder and in-kind trade were associated with lowland territories, where there were vast pastures and bio-climatic conditions favourable for wintering. The temporary neighbourhood with settled population groups provided the opportunity for economic relationships, political contacts and cultural ties.

The mountain type of nomadic farming was transformed during the introduction of the socialist system in the 1930s, when nomadic groups were forced to settle on their traditional wintering territories. The ploughing up of vast winter pastures provided fodder for winter. However, migration to spring, summer and autumn pastures with the animals remained an important principle in the organisation of stockbreeding in Central Asia. Plains and mountains in the region have thus always been connected over adapted and interconnected land use systems.



Today, mountains play a double role for the states of Central Asia. On the one hand, mountains are barriers obstructing trade and economic relationships and thus negatively affect the transition to the market system in mountain territories and the general economic development of mountain countries. On the other hand, to a certain extent mountains also shelter mountain territories from the influence of negative processes associated with the ongoing globalisation of the world economy, such as the destabilisation of economies. Until recently, collective or state farms and forestry cooperatives were the main farming units in the “mountain-lowland” system of Central Asia. A peculiarity of land use in agriculture was that farms had plots of land in all vertical zones. The land on the foothills and plains with their well-developed network of settlements and infrastructure was used for farming, while the mountain territories were used for grazing and hay-making and were mainly located within the boundaries of forestry cooperatives. The annual agricultural cycle involved practically all types of land, including nival and glacial terrains. The plans of economic development provided the use of alpine meadow resources, which was reflected in the planned volumes of meat production.

Fig. 6

Yaks are an opportunity for high mountain pasture use if markets for Yak products can be developed.

Photo: Ulrich Lutz,  
June 2000



Table 9

Realms	Core problems	Weighting by country <sup>1)</sup>			
		KG	KZ	TJ	UZ
Political & institutional	1. Inadequacy of the institutional basis	5	6	5	4
	2. Absence of a mountain development strategy	3	5	5	4
	3. Conflicts and conflict potential	5	4	6	6
Socio-cultural & economic	4. Difficult access to the market and weak market infrastructure	6	5	5	4
	5. High unemployment rates and drain of professionals	6	6	6	5
	6. General atmosphere that discourages investment	4	7	6	6
	7. Food security	5	4	5	4
	8. Low level of public services	5	5	5	3
	9. Weak taxation base and insufficient budgets in local communities	6	6	6	5
	10. Insufficient knowledge of highland use potential	4	7	5	5
	11. Lack of cultural and traditional knowledge	5	6	5	4
	12. Marginality of territories	5	5	5	3
	13. Deficit of available energy resources	4	6	6	5
Population & livelihoods	14. Population "ageing"	5	6	6	2
	15. Population drain	6	6	6	2
	16. Increasing disease rate	4	5	6	4
	17. Low income (poverty)	6	6	6	6
	18. Difficult bio-climatic conditions	3	6	6	4
Infrastructure & land use	19. Undeveloped infrastructure	6	6	6	4
	20. Weak planning and management system	4	4	5	4
	21. Lack of practice and motivation in resource use	5	5	5	5
	22. Weak ecological control	3	4	4	3
Bio-physical & ecological	23. Land degradation (all types)	4	4	5	5
	24. Interruption of animal migration routes	3	3	3	1
	25. Poaching of wildlife	2	4	5	4
	26. Increasing occurrence of natural disasters	3	4	4	3
	27. Insufficient ecological research	5	7	6	3

Weighting of core problems in the syndrome context of high mountain and highland-lowland areas.

Legend:  
 KG: Kyrgyzstan  
 KZ: Kazakhstan  
 TJ: Tajikistan  
 UZ: Uzbekistan

<sup>1)</sup>Weighting by participants:  
 1: problem is not relevant at the global scale  
 7: problem is a "worst case" at the global scale

Source:  
 SPSP, 2002

Today farmers are no longer able to move animals to remote summer pastures. Their livestock is concentrated on the village pastures, leading to overgrazing and degradation (Wilson, 1997). The former summer pastures are forced to "rest" because the number of livestock has been significantly reduced. This has also resulted in a rapid reduction of land under fodder

crops: “bread” independence and the export of other crops is seen as a priority. Sometimes lands were left uncultivated due to a lack of finances. Along with this, the organisational questions of the allocation of pasture land among farming units have not yet been settled.

The participants of the Kashka-Suu Workshop evaluated the mountain syndrome context on a country-by-country basis, looking at the specific core problems of the different mountain and highland-lowland situations. Table 9 (p. 209) presents the results of the weighting by groups. The wide range of scores between 2 and 7 indicates high variability, but the overall average of 4.8 shows the relative importance of the syndrome in this context, even though it is the lowest in comparison with the other two contexts (Table 8). Problems within the socio-economic and the population-and-livelihoods scientific realms were rated higher than those in the other three realms, which indicates the high level of poverty and economic despair in the mountain regions. When comparing the different countries, it is obvious that Kazakhstan and Uzbekistan have less important problems than Tajikistan and Kyrgyzstan (cf. Gov. of the Kyrgyz Republic, 2001), which have a much higher percentage of mountainous territory.

### **7.4.3 Intermediate development zone syndrome context**

Important zones in this context are the zone along the northern footslopes of the Tien Shan mountain range, with the Almaty area in the East and the Chuy Valley and Bishkek in the West; the Tashkent area west of the Tien Shan range; and most important, the Fergana Valley in the centre between the Tien Shan and Pamir mountains. The Fergana Valley is an ancient historical and multi-ethnic centre of Central Asia, through which the routes of the Silk Road passed in ancient times and during the Middle Ages. The valley’s favourable geographic location not only allowed for high economic and cultural development, but also attracted an inflow of many ethnic groups: by the end of the 19<sup>th</sup> and the beginning of the 20<sup>th</sup> centuries the area was one of the most highly populated regions in Central Asia, and it was further promoted during the Soviet period.

Nowadays, by the opinion of politicians, the Fergana Valley is a potential source of instability due to its ethnic diversity and high population density. The situation is aggravated by the economic problems in the states of the region, the increase of unemployment, especially among young people, and the states’ boundary problems (Kloetzli, 1994). Undoubtedly, one of the rea-

sons for this situation is the misbalance of economic and demographic processes. Even during the Soviet period, population density in the Fergana Valley was higher than 300 people per km<sup>2</sup>, which is relatively high for an agricultural area. As a consequence, the population of the Fergana Valley is experiencing an increase in poverty, growing unemployment, the collapse of health care and environmental degradation. Specialists also note an aggravation of problems such as inter-confessional relationships in boundary zones or ethnicity of socio-economic relationships (Tabyshalieva, 1999).



Fig. 7  
Manifold  
small-scale  
economic  
activities are  
undertaken  
by private entre-  
preneurs, such  
as this group of  
women making  
a felt carpet.  
Photo:  
Brigitte Portner,  
August 2001

Table 10

Weighting of core problems in the syndrome context of the intermediate development zone.	Realms	Core problems	Weighting <sup>1)</sup>
	Source: SPS, 2002 <sup>1)</sup> Weighting by participants: 1: problem is not relevant at the global scale 7: problem is a "worst case" at the global scale	Political & institutional	1. Ineffective state governance and decentralisation
2. Weak democratic institutions			5
3. Absence of rule of law			6
Socio-cultural & economic		4. Growth of informal economy	6
		5. Misbalanced (non-transparent) budgets	6
		6. Inadequate privatisation	5/7 (KZ)
		7. Uncompetitiveness of economy within the world market	5
		8. Increasing unemployment	5
		9. Negative impact of globalisation on the economy	4
		10. Non-developed financial sector	4/2 (KZ)
		11. Loss of social and cultural values	5
		12. Collapse of social and cultural infrastructure	6
	Population & livelihoods	13. Low living standards, poverty and diseases	5
14. Social depression		5	
15. Increase in alcoholism, drug addiction and prostitution		5	
16. Lack of balance between economic and demographic growth		5	
17. Marginalisation of small towns		4	
18. Increasing migration from rural to urban areas		5	
19. Gender inequality		4	
Infrastructure & land use	20. Destruction of existing infrastructure	6	
	21. Land degradation	4	
Bio-physical & ecological	22. Degradation of the environment	5/7 (KZ)	
	23. Air pollution in large cities	4	
	24. No access to drinking water	5	
	25. Reduction of biodiversity	3	

The participants of the Kashka-Suu Workshop evaluated the intermediate zone syndrome context as a single zone. Table 10 presents the results of the weighting by groups. Priority in this intensively developed urban and peri-urban context is clearly given to the political and institutional realm with an average score of 5.7 (Table 8). This can be explained by the high political activity in this zone, which is based on the institutions of power and authority that are concentrated in the administrative centres, on the political literacy of the population and on formal and informal political structures.

Nearly equal scores of 5.4 were given to problems within the socio-economic and the infrastructure and land use realms, which is fairly significant for

this zone with its high potential for development, since the economy of the Central Asian states relies mainly on these areas, and the main flow of material, financial and human resources is directed here. Population and livelihoods are in a comparatively better state in this syndrome context, hence the related problems were given a score of only 4.7. Infrastructure needs are pronounced because of the high population densities, which is reflected in the average score of 5.0. The bio-physical and ecological realm, finally, received a score of only 4.5. This is quite logical for this development-oriented zone, where the main task is to improve production and to feed people. Nevertheless, within the bio-physical and ecological realm the problem of environmental degradation has been assigned a score of 5 in general and even 7 for Kazakhstan.

#### **7.4.4 Semi-arid syndrome context**

The evaluation of this syndrome context was based on the Aral Basin. The Aral Basin includes the watersheds of the SyrDaria, AmuDaria, Tejen and Murgab rivers, the Karakum channel, small rivers coming from the Western part of Tien Shan and Kopet-Dag, as well as some inlands between these rivers and around the Aral Sea. Administratively, this region encompasses the entire territory of Uzbekistan and Tajikistan, part of Kazakhstan (Kyzylorda, South Kazakh and the southern part of Aktiubinsk Oblast) and Kyrgyzstan (Osh and Naryn Oblasts), Turkmenistan (without Krasnovodsk Oblast), as well as the northern part of Afghanistan and northeastern Iran (Glazovsky, 1990).

In the early 20<sup>th</sup> century, the Aral Sea was one of the largest closed continental watersheds of the world. In the 1960s its volume amounted to 1,064 km<sup>3</sup>, the area of the water surface was 66,400 km<sup>2</sup> and the water level at 53 m. Between 1960 and 1990 there was a sharp reduction of inflow to the Aral Sea, caused by the diversion of water from the SyrDaria and AmuDaria rivers to supply the extended area of irrigated lands. It should be noted that in the period of human history (2-4 millenniums B.C.) the Aral Sea reduced its aquatic surface several times to its present size. Although human-induced climate change may have caused dry periods to become more pronounced (Linotte, 2001), at that time the only reason for the shrinking was climate. In the past 40 years, however, the process of aquatic surface reduction has been accelerated by a factor of 2, with dramatic consequences for the ecosystem. From 1960 to 1998, the Aral Sea lost 900 km<sup>3</sup> of river water, the level of the Sea was reduced by more than 16 m, the volume decreased by 7.5 % and the

area of water surface was halved. Water salinity, which in 1965 was 9.94 grams per litre, increased to 35–45 grams per litre.

The basin of the Aral Sea tributaries is prevalingly semi-arid, particularly at lower altitudes. While large-scale irrigation systems exist along virtually all tributaries, the areas in between consist of semi-arid to arid landscapes which are used for livestock grazing where possible. Industrial use is equally widespread, since this sector was particularly promoted and developed during the Soviet era. In all land use systems, degradation of vegetation, soil and water is widespread. The use of biomass for fuel has rapidly increased after transition, at the expense of the woody vegetation of river valleys and desert and semi-desert plains. The loss of surface water and vegetation oases is one of the reasons for diminishing wildlife populations; however, the main reason has been poaching as an alternative for jobs lost due to decreasing economic activity.

In their evaluation of the semi-arid syndrome context, the participants of the Kashka-Suu Workshop differentiated their weighting according to different land use systems. Apart from general scores for the context as a whole, agricultural land (irrigation systems), rangelands (livestock herding) and industrial areas used for mining and energy were addressed separately. Table 11 presents the results of the weighting by these land use categories.

Highest scores were given to the socio-cultural and economic development realm (6.0), followed by bio-physical and ecological aspects (5.6). As mentioned above, the ecological problems in this context are very significant. Desertification and a delicate water balance characterise the dynamics of the natural environment. Unfavourable natural processes create difficult conditions for human activities. The realm of population and livelihoods was assessed at 5.5. Less important rankings of 4.1 and 4.0 were given to the realms of infrastructure and policy, respectively. These are nevertheless important due to the transboundary nature of water use, the problems of its regulation and the problems related to the rehabilitation of degraded natural resources.

Table 11

Realms	Core problems	Weighting by land use category <sup>1)</sup>			
		General context	Agri-cultural use	Live-stock use	Mining and energy use
Political & institutional	1. Lack of legislative differentiation	2	2	2	2
	2. Lacking balance among ecological, economic and social aspects	3	3	3	3
	3. Lacking coordination of use and protection of natural resources	5	5	5	5
	4. Problems of transboundary cooperation (e.g. water)	7	7	2	2
	5. Geopolitical instability of Central Asian countries	6	6	6	6
Socio-cultural & economic	6. Aged technologies	6	6	6	2
	7. Negative trends in education, intellectual potential and health	7	6	7	6
	8. Criminalisation of society (e.g. drug trafficking, cattle theft)	7	6	7	6
Population & livelihoods	9. High birth rates	5	7	7	5
	10. Worsening health status of population	7	7	7	7
	11. Migration	5	3	7	4
	12. Stratification of rural population	4	4	5	4
Infrastructure & land use	13. Irrational use of scarce water	6	7	2	4
	14. Weak transport infrastructure	3	1	3	2
	15. Problematic diversification of land use	4	6	2	1
	16. Inadequate rehabilitation of land	6	5	7	6
Bio-physical & ecological	17. Disastrous destruction of forests	7	7	7	7
	18. Lack of livelihoods infrastructure (e.g. energy)	5	3	7	1
	19. Drinking water problems and pollution	7	7	7	7
	20. Aral Sea: accelerated desertification	7	7	7	6
	21. Degradation of pastures as well as irrigated and non-irrigated lands	7	7	7	6
	22. Problems of industrial waste	3	3	2	5
	23. Lack of nature protection within the economic infrastructure	3	5	5	2
	24. Lack of sustainable development research	5	5	5	5
	25. Collapse of scientific infrastructure	6	6	6	6
	26. Disintegration of scientific relations	6	6	6	6

Weighting of core problems in the syndrome context of semi-arid lands.

Source:

SPSP, 2002

<sup>1)</sup>Weighting by participants:

1: problem is not relevant at the global scale  
7: problem is a "worst case" at the global scale



## 7.5 Research status and focus

### 7.5.1 Status of research in Central Asia

The positive aspect of the centrally planned economy during the Soviet period was the establishment of a system of management of economic and natural resources, including institutions of research, design and organisation, as well as associated public authorities. Scientific research was mainly carried out by institutions and organisations that realised both fundamental and applied research and had a developed network of testing stations and testing grounds. Independently or jointly with their head institutions, research and design institutes developed, or adapted to the natural conditions of the republic, scientific recommendations on “rational” uses of agricultural or agro-forest amelioration, water management and irrigation technologies. These technologies were then tested by networks of testing stations in all soil-climatic zones, and those with a positive result were put into practice. Outcomes were provided by a network of institutes that was built up in the mid-1950s and was in charge of all research at the same time and in control of land, forest and water resources. This network also guided the activities of all natural resource users. Furthermore, socio-economic and political fields of research were strictly controlled by the centralised management system. Critical research addressing negative side-effects of technologies and identifying knowledge gaps was almost totally suppressed. Environmental issues were rarely included in scientific activities, and integrative, inter- or trans-disciplinary approaches involving populations concerned or other stakeholders from society, economy and administration were unknown. Mitigation research, finally, has not been known so far, although the need for tackling environmental problems had been identified along with observations about negative effects of modern development since the early 1980s.

Today, scientific institutions in Central Asia are not experiencing a positive situation. Since the early 1990s, the transition to the market system has a negative impact on practically the entire budget and financing. Lack of funds resulted in deterioration and collapse of the resource base, followed by an outflow of qualified personnel. The centrally organised economy disintegrated, and the institutions towards which all science was directed disappeared along with it. Although today science is still represented by the national academies of sciences, sectoral and departmental research organisations and higher educational institutes, these lack the necessary budgets to redirect their focus. Besides these institutions, alternative research pro-

grammes have emerged, based on private or external capital. A large number of research activities are financed by international organisations and donors under concrete projects and programmes. The activity of NGOs in the scientific sphere is increasing. However, there is no interaction or coordination between research structures, departmental interests prevail, and no systematic research is being done. Research projects are implemented independently, frequently leading to duplications.

### **7.5.2 Research themes enhancing mitigation at all levels and in all contexts**

The participants of the Kashka-Suu Workshop were invited to propose research themes that they considered relevant to syndrome mitigation in each of the 3 contexts. All in all, 62 research themes were proposed (SPSP, 2002) and positioned in the different scientific realms identified for each context. Although the themes were very unevenly distributed between the different scientific realms and syndrome contexts, they showed good correlation with the key problems described in the previous chapters.

Research themes of political and institutional character (19 in total) were the most significant for the context of intermediate, urbanised zones. Among the 12 themes in this context, there were themes related to state reform, decentralisation and strategy management for sustainable development. In the socio-cultural and economic realm (11 themes), priorities were given to intensively developed and urbanised contexts: 8 out of 11 themes addressed this context. Population and livelihood themes (7 themes) mainly addressed the mountain context. Within the general “average”, the highest score was given to themes on the furthering of market opportunities. The scientific realm with the most themes was the bio-physical and ecological (20 themes out of the listed 62); nearly half of these themes (9) referred to high-mountain territories.

### 7.5.3 Proposed research focus in each of the three syndrome contexts

In a next step, the participants of the Kashka-Suu Workshop were invited to rank all themes according to the following score:

- (1) very important and urgent
- (2) very important but less urgent
- (3) important and urgent
- (4) important but less urgent
- (5) less important but urgent
- (6) less important and less urgent

Below, all proposed themes ranked (1) and (2) are listed in separate boxes for each syndrome context. As can be seen from the boxes, more than half of all themes in the first 2 categories are located in the intermediate context (10), where there is a concentration of population pressure and administrative power. The two other, more marginal contexts received 5 and 4 very important themes, even though they are much larger in terms of area.

#### **Box 6: Very important research themes in the mountain context**

- Socio-economic realm: ways to halt progressive marginalisation of populations in mountainous areas (1)
- Socio-economic realm: planning of socio-economic development of certain local rural communities (2)
- Livelihoods realm: options to increase income possibilities and marketing opportunities for rural populations (1)
- Ecological realm: make broadly available but hidden ecological data accessible and useful for more informed decision-making through GIS and modelling approaches (1)
- Ecological realm: evaluation of the potential of mountain ecosystems in Central Asia (2)

In the context of high-mountain territories, which accounts for 21 out of 62 research subjects, nearly half of the themes were associated to the bio-physical and ecological realm (9 out of 21). However, in importance the socio-economic and livelihood themes ranked highest (Box 6). Nevertheless, ecological themes were also considered very important.

**Box 7: Very important research themes in the intermediate context**

- Political realm: problems of and opportunities for reforming the system of local self-government (1)
- Political realm: improvement of the decision-making system for sustainable development strategies in Central Asia (1)
- Political realm: development of a strategic framework for decentralisation including legislative, economic, financial concepts in support of self-governance institutions (1)
- Political realm: public administration reform at the central level (governance effectiveness) (1)
- Political realm: mitigation of international to local conflicts related to conflicting interests over the use of shared (transboundary) resources (2)
- Political realm: democratisation of law process (transparency and accountability) (2)
- Socio-economic realm: modelling and forecasting social, demographic and economic processes (1)
- Socio-economic realm: progress and the scales of migration of villagers to urban areas
- Infrastructure realm: maintenance and renewal of vital infrastructure through allocation of responsibility and means (local, sub-regional, national) (1)
- Ecological realm: possibilities to establish water supply systems for villages located along the foothill and mountain areas (1)

Out of all 62 research subjects, 30 were allocated in the intermediate context, where the first priority was given to the political and institutional, the socio-cultural and the economic realms (Box 7). Two themes on infrastructure and ecology also made it into the top importance listing.

In the semi-arid context the first priority was given to infrastructure and ecology; socio-economic and political themes were considered less urgent (Box 8).

**Box 8: Very important research themes in the semi-arid context**

- Political realm: the concept of standards and economic optimisation of legal basis of nature conservation in Central Asia (2)
- Socio-economic realm: the concept of economic regulations of utilisation in ecosystems of Central Asia (2)
- Infrastructure realm: development of a monitoring and management system of water allocation for irrigated land use (1)
- Ecological realm: development of an environment quality management system in the Fergana Valley (1)

#### **7.5.4 Institutional situation of research in Central Asia**

Research within the considered syndrome contexts should cover various aspects of development. This includes the development of research institutions in the transition countries, as the current experience for tackling complex, interrelated situations in syndromes is insufficient. Capacity development should thus obtain a special place in the design of the JACS Central Asia activities of the NCCR North-South. Another focus should be given to the problem of poverty. Unfortunately, poverty is not an abstract concept for the former Soviet countries (Ilkahmov, 2001), and a better understanding of economic, social, political and ecological factors are all the more significant considering the limited territory and fragile natural resources of the region.

During the last decade, institutional systems and research capacities have been lost to a significant extent. Although manpower is still available at the institutions, they have been weakened by enormous financial cuts. On the other hand, NGOs and commercial research institutions have become active, because international organisations invited them to participate in research projects. However, state bodies, institutions and services with “power” and valuable information at their disposal should also be considered as prospective partners in any programme, as they supervise many networks of regional subunits. In addition, the Central Asian states have to some extent preserved the national academies of sciences, which were the “avant-gardes” of science in the countries. Despite the “aging” of personnel, the scientific divisions of the academic system have a potential to support the revival of science with their multiple relationships and rich pool of information. There is also a large body of higher educational institutions that have manpower capacity, a resource base and, as a rule, multidisciplinary representation. Finally, it is also possible to call upon the newly established NGOs and com-

mercial institutes, which have assembled skilled persons who left scientific institutions in search of more attractive working conditions.

### **7.5.5 Concluding remarks on the design of a research partnership programme**

Given the short time-frame of the Kashka-Suu Workshop (3 days) it is obvious that not all problems existing in Central Asia could be properly reflected and assessed. The same can also be said about the proposed research themes and contexts. A certain bias must be expected from the composition of the seminar, which had only 19 participants. Other shortcomings were the all-too-brief overview of the peculiarities of Central Asian states, the division of the region into contexts, as well as the conditional character of the assessments.

Nevertheless, the search for solutions to the existing problems and ways to mitigate the processes of global change in the region have put the task upon scientists and specialists to elaborate and develop new research paradigms and to apply new methodological tools. These were really novel to the scientists of the Central Asian countries, who are traditionally competent in sectoral research only. The transition to holistic, transdisciplinary research is a serious challenge that requires serious solutions. This should be considered when forming packages of research projects and intercultural teams. While there is an appropriate scientific capacity available in the region, continuous learning will be necessary for all involved.

Finally, it would be advisable to include monitoring of processes and impacts of the programme in order to complement the research component of the NCCR North-South in Central Asia. There is a real concern that information may be lost if there is no mechanism for its storage, analysis and dissemination. It would be reasonable if the programme committed itself to implementing a supportive component, such as a regional advisory board, which would function in the interest of the involved countries, feeding information into the interstate commission on sustainable development, as well as to donors and to all stakeholders concerned.

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## 8 JACS South Asia

# Sustainable Development in Marginal Regions of South Asia

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with the support of

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Fig. 1

The valley of Swat  
in North West

Pakistan.

Photo: U. Geiser



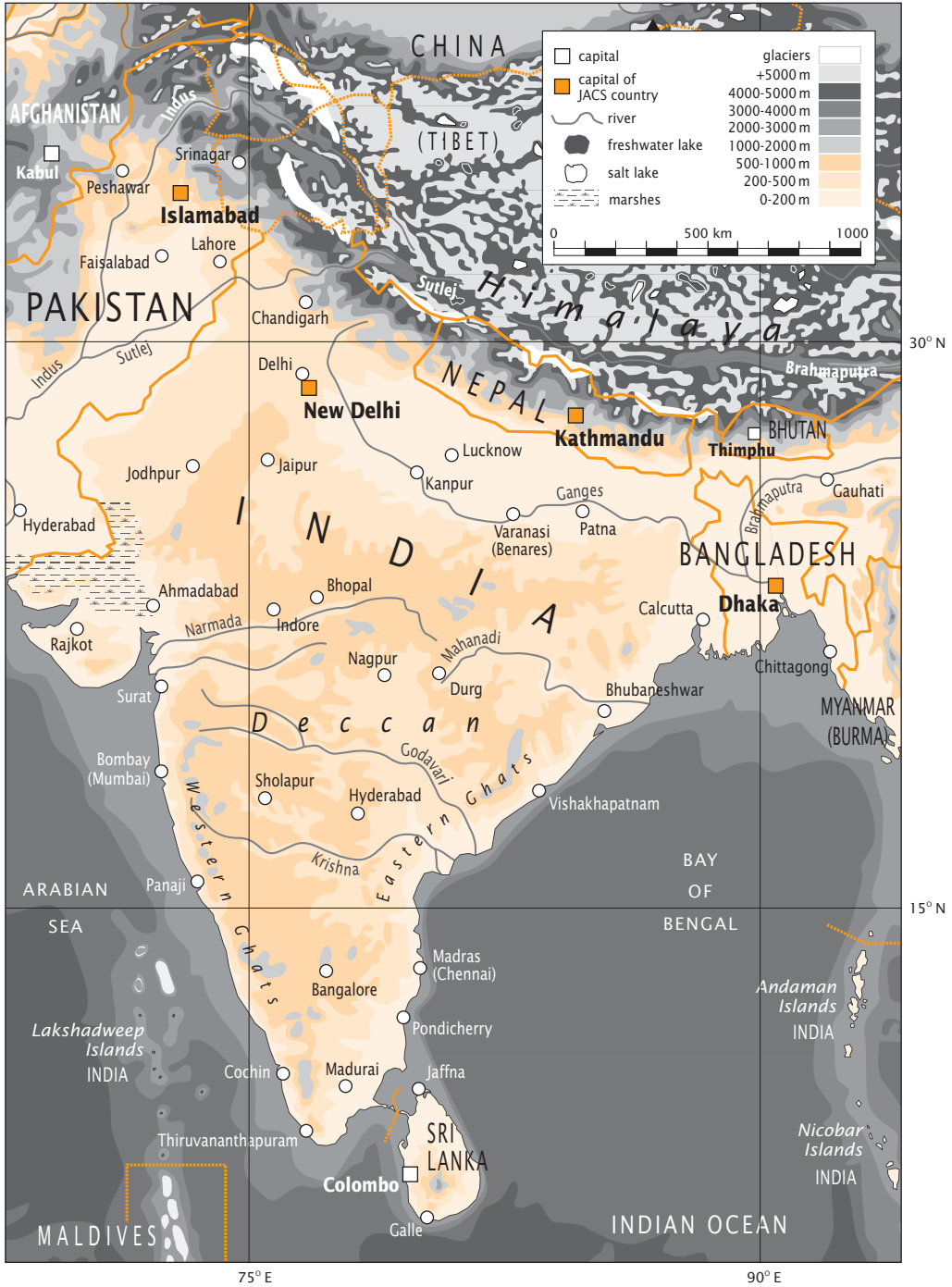
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\* This report is partly based on the minutes of a workshop held in Kathmandu, August 2001  
(participants are listed in Annex 1, p. 450)

## Abstract

The population of the South Asian subcontinent includes 500 million people who subsist on less than one dollar a day and together make up 40% of the world's poor. In a workshop, participants from Bangladesh, India, Pakistan and Nepal, among them scientists as well as NGO representatives, joined together to determine the focus of NCCR North-South research activities in South Asia. The consensus was that core problems associated with syndromes of global change are most acute in marginal regions and among marginalised people. As many of South Asia's marginal areas are mountainous, problem clusters were considered to be specific to the "highland-lowland" syndrome context. It was concluded that within the JACS South Asia there is a need for research on the impact of global change upon marginal areas and within both the "highland-lowland" and the "urban-peri-urban" syndrome contexts as defined by the NCCR. Research will therefore be focused upon marginal or fragile mountain areas (i.e. those at risk due to climatic or environmental conditions in addition to their economic situation). In selected case study localities, rural livelihood strategies will be analysed to identify key factors impacting upon sustainable development. Institutions and policies that shape important processes like natural resource use, migration and rural development will form the focus of analyses.

*Fig. 2: Overview of South Asia. The main partner institutions of the NCCR North-South are located in the capitals of Bangladesh, India, Nepal and Pakistan, and in the Indian cities of Gauhati and Thiruvananthapuram.*



## **8.1 South Asia: an introduction to the subcontinent**

### **8.1.1 Definition of the region**

The region of South Asia is defined differently by different organisations and authors. The South Asian Association for Regional Cooperation (SAARC) consists of Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka; other authors, for example Nohlen and Nuscheler (1994) also include Myanmar. For operational purposes, the JACS South Asia consists of countries in which our programme is currently active, namely Pakistan, Nepal, India and Bangladesh (Fig. 2).

### **8.1.2 First glimpses**

South Asia is a subcontinent of great contrasts and extremes. The region is made up of a broad diversity of ecosystems ranging from deserts to areas in Assam with some of the highest annual rainfall records in the world. The region incorporates the highest mountain on Earth and is home to some of the world's greatest cultures and civilisations that share many cultural, social, historical and religious traditions. While only 1 % of the gross capital market flows to developing countries reaches South Asia (World Bank, 2000), in recent years, the collective South Asian economy has become one of the fastest growing in the world, with an average GDP growth rate of 5.4 % in 1999 (World Bank, 2000).

South Asia is also home to 40 % of the world's poor, with 500 million people living on less than one dollar a day (World Bank, 2000). There is a wide disparity between the economic status of the region's various countries, the differential between the economies of Nepal and India being a case in point. Nepal, one of the region's poorest nations, is reported to have a GDP per capita of USD 1,237. Those of Bhutan, Bangladesh and Pakistan range from USD 1,341 to 1,834, and all four nations exhibit low Human Development indices (UNDP, 2001). The Maldives, Sri Lanka and India have much higher annual GDP per capita of USD 4,423, 3,279 and 2,248 respectively. If one compares these figures with the world average of USD 6,980 it becomes evident that the majority of South Asian countries are very poor.

Politically, South Asia is facing many critical tensions both between countries (such as the ongoing conflict between India and Pakistan) and within coun-

tries (e.g. civil war in Sri Lanka; Maoist insurgency in Nepal; tribal insurrection in North East India and Bangladesh). While political discord has wide-ranging implications for the region as a whole, the impact of shocks associated with conflict is strongest in the marginal regions of South Asia.

### 8.1.3 General statistics

Table 1 provides some key data for the countries involved in our operational programme, including indices of health and of social and economic development:

Table 1

	Year	Bangladesh	India	Nepal	Pakistan
<b>Geography and social indicators</b>					
Surface (thousand sq. km)	2000	144	3 287	147	796
Total population (million)	2000	137.4	1 008.9	23	141.3
Annual population growth rate (%)	1990–2000	1.6	1.8	2.4	2.5
Urban population (% of total population)	2000	25	28	12	37
Annual urban growth rate (%)	1990–1995	5	2.9	7.5	4.7
<b>Development and economic indicators</b>					
GDP per capita, at purchasing power parities (USD)	2000	1602	2 358	1327	1928
HDI rank (total 173)	2002	145	124	142	138
Human Poverty Index (% of population below poverty line)	1989–2000	35.6	35	42	34
Population in agriculture male / female (% of labour force)	1998–2000	–	–	–	–
Public expenditure on education / health (% of total public expenditure)	1995–1997 / 1998	2.2 / 1.7	3.2 / –	3.2 / 1.3	2.7 / 0.7
Population with access to safe water / adequate sanitation (%)	2000	97 / 53	88 / 31	81 / 27	88 / 61
<b>Environmental indicators</b>					
Crop land per capita (hectares)	1997–1999	0.06	0.17	0.13	0.16
Area of severe soil degradation (% of country)	2000	27	59	27	24
Protected area (% of total surface)	1999	0.8	4.8	7.8	4.8
Energy consumption per capita (kilogram of oil equivalent)	1999	139	482	358	444

Some key indicators for the countries of the JACS South Asia.

Sources:  
UNDP, 2002;  
World Bank,  
2002a+b;  
FAO, 2000

Although evidence from both macro-level and micro-level research indicates that South Asia has entered the early stages of fertility transition, there is also evidence suggesting that the region's population will continue to grow rapidly for another century (Sathar and Phillips, 2001). Placed within the global context, the total fertility rate (TFR) of South Asia is high. While the TFR of the world averages below 3 and that of East Africa is approaching replacement level, the South Asia region exhibits a TFR exceeding 4 (UNFPA, 1989). As illustrated in Table 1, there is a pronounced variation between countries in demographic profile, reflecting differences in the pace of fertility transition and the rate of population growth, together with differential rates of onset of mortality decline (Dyson, 2001).



Fig. 3  
A general over-  
view of population  
densities in South  
Asia.

Source:  
[http://www.grida.  
no/cgiar/images/  
sc\\_popd.gif](http://www.grida.no/cgiar/images/sc_popd.gif)

As Fig. 3 illustrates, population distribution is also linked to natural conditions. Densely populated areas (illustrated by greater colour intensity on the map) closely correspond with environmental features such as alluvial, well-irrigated plains and coastal areas. Populations are more thinly distributed (paler areas of Fig. 3) in less hospitable mountains and deserts.

## 8.2 Selection of “syndrome contexts” and their core problems and opportunities

### 8.2.1 General problems and opportunities for sustainable development in South Asia

At the beginning of the Kathmandu workshop, participants brainstormed their perceptions of key problems and opportunities regarding sustainable development in South Asia. These perceptions focused on the role of the state and negative impacts of development interventions. Opportunities for sustainable development were recognised in the potential to increase participation and empowerment of civil society and of women and marginalised groups in particular. The effects of economic processes associated with cultural erosion, such as neo-liberalisation, were perceived to be counterbalanced by opportunities to strengthen autonomy and free access to markets. New information technologies were considered to offer a potentially wide range of opportunities. Table 2 shows the group’s consensus with regard to core issues. The table also highlights the fact that many issues can be either problems or opportunities, depending on the way they are addressed.

### 8.2.2 Selection of syndrome contexts

In the course of the South Asia workshop, consensus was reached on a central theme: that core problems associated with syndromes of **global change** are most acute in **marginal regions** and among **marginalised people**. (The notion of global change is used to include both environmental global change and economic, socio-political and cultural globalisation.) The term “marginal regions” incorporates a complex interplay of factors. Generally, it refers to areas that are partially or completely isolated from the mainstream of development. Spatially, marginal regions may be peripheral areas characterised by adverse physical conditions, where key considerations include distance from major centres of innovation and service facilities. At the same time, however, marginal areas exist within the urban context, as in the case of urban slums, where proximity to services is rendered invalid.

The workshop participants then tested all problems and opportunities identified in South Asia (Table 2) for their relevance within the so-called syndrome contexts of specific regions in which the NCCR proposes to undertake future research. This NCCR proposal was intensively discussed and its pros and cons documented (see Minutes of the International Workshop,



2001). During this discussion, the notion of “fragility” was introduced as an alternative to “syndrome context” in order to initiate a debate on more adequate and innovative regionalisation of the South Asian space. One group of participants were of the opinion that research should focus on people, most importantly, indigenous people, rather than on specific geographical areas. This concept was based on the argument that indigenous people throughout South Asia might be considered marginalised. In terms of the definition of “syndrome context”, the term “tribal area” – a spatial category – suggests a boundedness of areas of habitation which in practice does not exist on the

Table 2

List of core problems and opportunities in South Asia.	Scientific realms	Problems	Opportunities
	Political & institutional	Shrinking role of the state; lack of coordination (between sectors and levels); lack of capacity for implementation; unplanned debts and pressure from international lenders; unequal participation in decision-making; non-participatory approach; adoption of inappropriate technology/ development model; erosion of indigenous institutions and knowledge	Participatory mobilisation; political awareness; role of civil societies; institutional capacity building; regional cooperation
	Socio-cultural & economic	Intolerance towards ethnic and cultural diversity; “coca-colaisation”; changing consumption and production patterns; tourism; privatisation and commercialisation; growing inequality and imbalance; commercial plantations; trade liberalisation through WTO; multilateral/bilateral trade agreements; health patenting; bio-piracy and piracy of indigenous knowledge	Cultural interaction; autonomy of users/producers; markets for traditional commodities; market access; opportunities (jobs, income) through trade and tourism; migration
	Population & livelihoods	Population growth; migration/relocation; illiteracy; gender inequity; livelihood sustainability at stake; urbanisation and urban slums	Education and empowerment; gender equity
	Infrastructure & information	Absence of access to infrastructure services; unequal flow of information	Access to information (minority rights, human rights); networking; information exchange using new IT
	Bio-physical & ecological	Land degradation and natural disasters; unequal distribution of resources	Conservation and development; preservation of biodiversity

Indian subcontinent. Very often nowadays, “tribal” communities in mountain regions, semi-arid areas and urban and peri-urban contexts live interspersed with communities representing locally or nationally dominant populations.

Keeping in mind the views of many participants on problems associated with the syndrome concept, we concentrated on the identification of core problems within one main syndrome context, i.e. **highlands and their interactions with lowlands**. Mountain areas are linked with urban and peri-urban areas by migration and other processes (including the livelihoods of indigenous people), and cities are situated in both mountains and plains. Therefore, the urban and peri-urban syndrome context was added. Three working groups were formed according to the main research interests and problem perceptions of the workshop participants, who belonged to various scientific disciplines and NGOs. Table 3 indicates the three groups, each of which had its own special perspective on the highland/lowland syndrome context.

Table 3

	<b>Marginal area group (Nepal, Pakistan)</b>	<b>Fragile area group (Kerala, Pakistan)</b>	<b>Indigenous people group (NE India, Bangladesh)</b>	Syndrome contexts and focus of working groups.
Highland-lowland areas	xxx	xxx	xxx	
Urban and peri-urban areas	x	x	x	

### 8.2.3 Core problems and opportunities identified by the three groups

The core problems and opportunities identified by the three working groups are detailed in Tables 4, 5 and 6 and consolidated in Table 7.

#### *Marginality in mountain areas (including relations to lowlands):*

The mountains of South Asia are characterised by diversity in size, altitude and physiography, and also in the ethnic and cultural diversity of their inhabitants. Mountain areas are not necessarily always marginal areas. Indeed, Nepal’s main economic and tourism centres of Kathmandu and Pokhara are situated in the mountains. It is therefore clearly more appropriate to focus upon marginal areas within mountains, rather than upon mountains *per se*.

Table 4

List of problems and opportunities: marginality in mountain areas in relation to lowlands.

Scientific realms	Problems	Opportunities
Political & institutional	Lack of effective government support – implementation, coordination, efficiency. Unequal participation in decision-making. Erosion of indigenous knowledge and institutions.	Strengthening civil societies. Strengthening local institutions. Minority and human rights. Political awareness.
Socio-cultural & economic	Intolerance of ethnic and cultural diversity – lack of understanding and respect. Tourism.	Market access. Tourism (regulated). Regional interactions and influences. Conservation input/output sharing. Food security.
Population & livelihoods	Population growth – pressure on resource base. Migration and relocation – immigration and emigration. Options for sustainable livelihoods threatened – resource base – short-term vs. long-term gains.	Education and empowerment (gender issues). Temporary migration and new job opportunities.
Infrastructure & information	Unequal access to infrastructure services – information, education, health, transport.	
Bio-physical & ecological	Degradation of natural resources and increasing vulnerability.	Conservation and development. Preservation of biodiversity.

*Indigenous people in mountain areas (in relation to lowlands):*

This working group shared a widely-quoted definition of “indigenous peoples” (registered in UN Document No. E/CN.4/Sub 2/1986/7): “Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of societies now prevailing in those territories or parts of them. They form at present a non-dominant sector of society and are determined to preserve, develop and transmit to future generations their ancestral territories and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems.”

Table 5

Scientific realms	Problems	Opportunities	List of problems and opportunities: indigenous people in mountain areas in relation to lowlands.
Political & institutional	Governance – denial of self-determination and self-governance. Erosion of indigenous institutions and knowledge.	Minority and human rights. Participatory mobilisation. Institution-building.	
Socio-cultural & economic	Intolerance of ethnic and cultural diversity. Privatisation and marketisation – privatisation of commons – commercial plantations – marketisation of land – land alienation. Unequal distribution of resources – economic input.	Regional cooperation. Employment opportunities. Markets for traditional commodities.	
Population & livelihoods	Gender inequity – inheritance – political representation – economic acknowledgement. Livelihood sustainability at stake. Migration and relocation – land alienation – social/ethnic conflicts – militarisation – exploitation.	Gender equality. Education and empowerment.	
Infrastructure & information	Unequal distribution of resources – health / education / sanitation – absence of access to infrastructure services. Unequal flow of information.	Access to information.	
Bio-physical & ecological	Land degradation and natural disasters – monoculture – settlers – militarisation – overgrazing and over-cropping by settlers.	Biodiversity.	

*Fragile areas in mountain areas (in relation to lowlands):*

Fragile areas are defined as areas at risk with regard to climatic or environmental conditions; however, certain areas are also economically fragile. One shared feature of fragile areas is that development processes in these areas are not sustainable and that they are highly vulnerable.

Table 6

List of problems  
and opportunities:  
fragility in moun-  
tain areas in rela-  
tion to lowlands.

Scientific realms	Problems	Opportunities
Political & institutional	Withdrawal of state interventions from develop- ment and welfare programmes, but not from bureaucratic set-up. Weakening of the nation-state particularly in developing countries.	Institution-building. Participatory mobilisation. Decentralisation.
Socio-cultural & economic	Privatisation, marketisation, commercialisation – absence of appropriate regulatory mechanisms – international trade agreements and their implications.	Opportunities relat- ed to market access – investment due to cheap labour – export of tradition- al commodities – niche markets.
Population & livelihoods	Population growth and redistribution – demographic distortions. Livelihood sustainability at stake. Inequality and imbalances – access to resources and to livelihood opportunities. Gender dimension – increasing feminisation of work deprivation. Migration, relocation – migration and its implications – unskilled labour – increased vulnerability of family members.	Migration.
Infrastructure & information	Access to social and economic infrastructure services – declining access to public services, health, education, food, roads, electric power etc. due to different state policies. Unequal flow of and access to information – digital divide, denial of right to information.	Access to information – global networks.
Bio-physical & ecological	Resource degradation (land, water, forest, com- mon property resources). Cropping pattern imbalances / food insecurity – limited choices – mono-cropping, commercial plantations – imbalance in cereal production.	Integrated manage- ment and conserva- tion of natural resources. Conservation of indigenous knowledge and biodiversity.

### 8.2.4 Consolidated list of core problems and opportunities and the identified research priorities

After thorough discussion in the three working groups with their respective focuses, the workshop moderators consolidated the three lists of core problems and opportunities into one. This exercise showed that several of the problems and opportunities appeared in all the contexts (see Table 7).

Among the themes that emerged from the workshop, the following cross-cutting issues are important to the NCCR as a whole:

- Livelihood complexity
- Decentralisation and natural resource management
- Role of state versus non-state institutions
- Conflicts between indigenous peoples and settlers
- Gender dimension of institution and livelihood issues.

Table 7

Scientific realms	Focuses		Consolidated list of core problems and opportunities
Political & institutional	Interventions and institutions	Role of state and civil society – withdrawal of state interventions from development and welfare programmes – relevance of the nation/state. Governance – governance problems (coordination, implementation) – self-determination and self-governance – effective government support. Education and empowerment. Strengthening of local institutions. Participatory mobilisation, decentralisation. Indigenous knowledge and institutions.	– research priorities.
Socio-cultural & economic	Market access Regional interactions and influences	Investment due to cheap labour. Export of traditional commodities. Niche markets. Employment opportunities. Regional networks and exchange of knowledge.	
Population & livelihoods	Livelihood sustainability at stake	Unequal access to resources and services to strengthen livelihood opportunities – health, education, power, food, infrastructure. Gender dimension – feminisation of work deprivation. Migration – vulnerability of family members – social and ethnic conflicts.	
Infrastructure & information	Flow of and access to information	Global networks. New IT possibilities.	
Bio-physical & ecological	Ecological sustainability	Resource degradation – land, water, forest. Cropping pattern imbalances and food insecurity – declining productivity in cereal production.	

## 8.3 Status and dynamics of core problems and opportunities in South Asia

In this chapter, the status and dynamics of core problems and opportunities identified in Chapter 2 are considered. The workshop participants underlined the **importance of addressing both problems and opportunities** simultaneously. Many aspects of globalisation can have both negative and positive impacts on people's livelihoods. When research focuses only on the problems associated with global change, it runs the risk of overlooking potential opportunities and the use people make of resources presented by globalisation (Backhaus, 1999).

Below, the arguments raised by workshop participants are clustered according to Table 7 in Chapter 2.

### 8.3.1 Political and institutional realm

#### *Weakening of nation/state, withdrawal of state*

The processes of global change have weakened some South Asian countries' capacity to influence international decision-making and to effectively manage their own economies and invest in human and social capital. The states have reduced their responsibilities towards social welfare, detrimentally affecting marginal people whose negotiating power within society is poor (Drèze and Sen, 1995).

#### *Denial of self-determination and self-governance*

Although South Asia, having gained independence from colonial rule and reducing feudal authority, is evolving democracies, marginalised people and those living in marginal regions often remain unrepresented. Little effort has been made toward integrating marginalised groups and giving them a voice in the political and economic mainstream. In many cases, governments have over-exploited natural resources they depend on (e.g. in the forest sector, conservation programmes, resettlement programmes).

#### *Unequal participation in decision-making*

Local people tend to be excluded from development-related decision-making processes. Although South Asian governments are beginning to involve local people in development planning processes (e.g. with the introduction of the Local Governance Act of Nepal or Panchayati Raj in India), margin-

alised groups remain excluded due to the persistence of social inequalities, such as widespread illiteracy, poverty and the caste system. Even where a “bottom-up” approach is apparent, social exclusion remains evident in the lack of women participating in local development-related decision-making processes (Geiser, 2001a).

#### *Lack of effective government support*

Poor marginal regions, such as some mountain areas of South Asia, are characterised by limited resources and high costs of development of basic infrastructure. Without effective government support, possibilities remain limited for the disadvantaged to improve their economic and social status. Some government programmes have failed due to politicisation of development activities at both the local and national levels. Poor management and lack of transparency, monitoring and accountability combine to obstruct sustainable development of marginal regions (Santhakumar, 1997).

#### *Strengthening local institutions and civil societies*

In order to exploit the positive development potentials presented by global change and offset – i.e. mitigate – negative impacts, institution-building must be supported to encourage a decentralised, inclusive, participatory approach. The success of community forestry projects in Nepal has illustrated the efficacy of such processes. By strengthening institutions at the local level, traditional skills, knowledge and technologies in the management of natural resources, services, economic infrastructures and institutions might be revived (Ostrom, 1990; Geiser, 2001a,b). This way the potential of marginal regions can be harnessed and resources optimised.

Civil society groups (Manor et al., 1999) such as non-governmental and voluntary organisations provide the momentum and capacity to manage and organise development at the community level. They present a vehicle by which development might be brought to respond to the needs of diverse groups within South Asian societies.

The vulnerable situation of indigenous and marginalised groups can also be offset by regional cooperation. In North East India, local-level political parties have recently joined together to form a common platform for shared interests. Cooperation between smaller groups of marginalised peoples enables them to exert a certain power within the mainstream of society (Manor, 1999; Thomas Isaac and Franke, 2000; Khan, 2000).





Fig. 4  
People in  
Kerala demand  
their rights.  
Photo: U. Geiser

### 8.3.2 Socio-cultural and economic realm

#### *Lack of ethnic and cultural tolerance*

South Asian countries share the common challenge of building a nation out of multiple cultural identities. Invariably, nation-building is based on the culture of dominant groups and religions, at the expense of other cultures within the society as a whole (Pfaff-Czarnecka, 1997).

#### *Erosion of indigenous knowledge and institutions*

Global change brings about an influx of novel concepts and information and creates new needs and opportunities that often cause devaluation of indigenous knowledge and institutions (Bodley, 1990). The powerful discourse of elitist science, technical expertise and perceived educational and cultural superiority overwhelms that of indigenous and marginalised populations (Müller-Böker, 1991; Gadgil and Guha, 1995; Agrawal, 1995; Kollmair, 1999; Geiser, 2002).

*Privatisation and marketisation of land*

Privatisation of common property resources (CPR) is an inevitable outcome of globalisation, which drives the processes of marketisation and privatisation. As a consequence, many previously common lands, forests and water bodies that traditionally formed the basis of livelihoods of local groups in rural areas have become the private property of individuals and corporate bodies. The consequential limitation of access of local people to natural resources threatens the welfare of communities depending on natural resources, as well as natural resources themselves (Suleri, 2001).

*Market access and marketing of traditional commodities*

One of the positive features of globalisation is investment in marginal areas. Many multi-national companies outsource their manufacturing to the South Asian region because labour is cheaper there than in Europe or America.

Market towns in marginal regions have the potential to stimulate local production via existing institutions that might facilitate the marketing and distribution of farm inputs and produce. Moreover, they might be supported to become effective centres for rural development activities and dissemination of information to the local population. Due to the remoteness of many rural communities in South Asia, many of the commodities they traditionally produce fail to reach major markets or achieve prices relative to the time and energy invested in them. Formation of production and marketing cooperatives, however, has emerged as an effective way of marketing the commodities of local people both at the national and international levels (Fisher et al., 1997).

*Tourism*

In the absence of integrated national development strategies, the economic potential of tourism remains unrealised and the negative impacts of seasonal concentrations of outsiders within certain locations are amplified (Nepal et al., 2002). In this way, tourism may contribute to the erosion of local cultural values, social systems and institutions, in addition to compounding environmental degradation, littering and pollution. In marginal areas such as mountains, the vulnerability of local people becomes intensified. Especially along mountaineering and trekking routes, tourism has been linked to deforestation, reduction in biodiversity and pollution of water, land and air. Unplanned growth of settlements, roads and other civil amenities also has a negative impact on the visual quality of landscape, which is often the central asset of tourism development. Experience has shown that the bulk of income

generated by tourism in mountain areas is not retained locally and does not contribute to developing the livelihoods of marginal populations. The potential for tourism development is one advantage that mountain regions have over lowland areas. Tourism provides opportunities for the development of remote and resource-poor mountain communities, without the need for expensive infrastructure and services (Nepal et al., 2002).

Tourism offers employment and entrepreneurial opportunities for mountain people including portering, petty trade, lodge-keeping and catering. It encourages the development of farming, commercial wood lots and cottage crafts in response to the demand created by tourists. Rising demand for locally produced goods contributes to the strengthening of local economies and livelihoods. Through the implementation of conservation and development programmes that utilise revenues from tourism, it also encourages biodiversity conservation and improvements in the regeneration capability of the environment (Soliva, 2002). Maintenance of cultural and historical monuments, increased pride in cultural identity and resurrection of festivals are some of the positive impacts of tourism on indigenous peoples.

#### *Regional interactions and influences*

There is a lack of policies and institutional regulations focusing on the interactions between highland and lowland areas in South Asia. Greater emphasis needs to be placed on these interactions in order to take account of the great differences between highland and lowland areas in production potential and ecological issues. Mountain slopes are more fragile, inaccessible and marginal than fertile lower valleys and plains. On the other hand, the production systems of valleys and plains are often affected by the down-flow of water, soil and nutrients from the fragile and marginal upper slopes. The benefits of flood control, irrigation and soil fertility maintenance via environmental conservation of the mountain slopes are reaped by rich valleys and plains located downstream, while the costs of conservation have to be borne by the people living upstream in marginal areas with low production potential (Müller-Böker et al., 2001). Mountain populations are often marginalised both by their exclusion from decision-making processes and by being deprived of the benefits of efforts to conserve fragile mountain slopes (Müller-Böker and Kollmair, 2000). Greater equity might be achieved by implementing a mechanism to share conservation costs and benefits between lowland and highland communities. Concurrently, mechanisms need to be instituted to enable highland communities to actively participate and have a voice in decision-making processes.

### 8.3.3 Population and livelihood realm

Concern over sustainable livelihoods (Chambers and Conway, 1992; Carney, 1999; Ellis, 1999) was a major issue among the workshop participants. While accelerated global change presents new opportunities for making a living, certain livelihood options have become threatened. Global change can, in some instances, lead to enhanced employment opportunities for marginal peoples, through the expansion of tourism, improved market access and industrial growth.

#### *Population growth*

The *State of World Population 2000* (UNFPA, 2000) points out that 23% of the world's population or around 1.4 billion people live in South Asia (excluding Afghanistan). In the period of 1995–2000 the average population growth rate of the region was 1.8% per annum, which is higher than the world average of 1.3% per annum. Population growth in mountain areas such as Nepal, Pakistan and Bhutan tends to be higher than the regional average, which is reflected in the high pressure on limited land and bio-physical resources, together with service provision such as schools and health facilities (UNDP, 2001).



Fig. 5  
State-controlled  
timber harvesting  
in North West  
Pakistan.  
Photo: U. Geiser

*Unequal access to resources and services:  
strengthening livelihood opportunities*

People in marginal areas – particularly those experiencing the syndromes of global change associated with mountain habitats – are faced with poor access to public services such as road transport, health care, education and electrical power. Many of the institutions responsible for service provision in South Asia do not use participatory and consultative approaches and exclude more disadvantaged stakeholders from decision-making processes. Consequentially, the extent of access to resources and livelihood opportunities differs between groups, with the poorest being also the most marginalised. While state law may theoretically provide equal protection to all members of South Asian societies, personal influence and financial position render law discretionary and constrain access of the most disadvantaged to services, resources and livelihood opportunities (Geiser, 2001a,b).

Fig. 6

Agriculture, the main component of livelihood strategy in marginal mountains, still depends on a huge input of manual labour (Annapurna Region, West Nepal).

Photo: H. Kaspar

*Food security*

The food security of disadvantaged people experiencing syndromes of global change in both rural and urban settings is vulnerable. People living in urban, non-agricultural fragile areas depend on produce from food producing areas. Poverty constrains their access to food, and their food security is vulnerable to market forces. While poverty is a factor influencing access to food in rural agricultural areas as well, nutritional security is also determined by population pressure on land, climatic change and other factors affecting yields, as well as crop spoilage and animal morbidity and mortality (Adhikari and Bohle, 1999).



### *Migration*

Despite the extensive literature on the tradition of migration in South Asia, the understanding of the dynamics of mobility of mountain populations (particularly seasonal labour migration) is poor. Nepal provides a good example of migration presenting both opportunities and problems. Most researchers consider migration to be a proactive strategy in response to poverty and the lack of opportunities in rural and mountainous areas (Blaikie and Coppard, 1998; Blaikie et al., 2002). With the development of transport infrastructure, an increasing number of young males from mountain areas spend increasing periods of time in wage labour in urban areas. While many mountain households depend on remittances to supplement subsistence economy, male migration has also been found to be a process that depletes the subsistence labour force of young, able-bodied males (Seddon et al., 1998). This places an additional burden on women, binding them to the village and reducing the scope of their livelihood options. People migrating from rural to urban areas for work often find themselves trapped in a cycle of low wages and high living costs. This reduces the potential of seasonal migration as a strategy to alleviate poverty in rural households (Campbell, 1997; Miller, 1990).

Whatever the reasons for migration may be, migration has a broad range of immediate and long-term impacts on the migrants as well as on the host communities. These impacts tend to be less than beneficial, an example being the conflicts that often arise between settlers and indigenous people (Weiner, 1978). A prime cause of the economic dislocation of local indigenous peoples is alienation and illegal transfer of land by migrants. On the other hand, land under shifting cultivation fails to enjoy the protection of ownership titles; instead, by classifying such areas as reserve forest, present legislation brings indigenous peoples in conflict with the concerns of nature and biodiversity conservation.

### *Gender equity and inequity*

Despite their socio-economic and political marginalisation, women in South Asia play a primary role in production, especially in subsistence agriculture. Globalisation brings about encroachment upon indigenous female domains, for example through the commercialisation of farming and cottage industries especially in India and Bangladesh. Physical displacement resulting from large-scale logging, dam construction and energy projects has caused an increase in the number of women migrating to cities in search of wage labour. Outside their established domains, under the influence of the hege-

monic culture, women often encounter erosion of their traditional autonomy (Molesworth, 2001), and traditionally female cottage industries are replaced by male-dominated factory production (Rana and Shah, 1987).

Development initiatives, such as the Women's Development Programme (WDP) launched in Nepal in 1981, have led to increased participation of women in development processes. The WDP has been used as a vehicle by multilateral organisations such as UNICEF and UNFPA to address wider aspects of health, education and livelihood development among disadvantaged sectors of society and enhance women's status and opportunities (UNFPA, 1989).

### *Health*

In the syndrome context of mountain areas, as well as for the poor of urban and peri-urban areas in South Asia, access to health services is limited. In remote areas, inadequate provision of facilities and transport constrain access to health care, while the limiting effect of poverty impacts upon the health of both urban and rural poor, who often fail to receive timely diagnosis, quality care or medication. The persistence of high levels of morbidity and mortality among marginalised communities places additional strains on the labour force at the household level, exacerbating situations of high fertility, child labour, illiteracy and poverty (Molesworth, 2001).

### *Education and empowerment*

In South Asia, poor funding and inadequate provision of educational infrastructure negatively influence school attendance and literacy rates. However, poverty and the need for children to contribute to the household economy are also major determinants of these children's access to education, especially in more remote areas.

On the other hand, education is a basic requisite for poor people to develop their economic and social status. NGOs, as alternative institutions to government organisations, have a role to empower marginalised people by providing non-formal and out-of-hours schooling and literacy training for adults and children whose economic responsibilities constrain their access to formal education (Molesworth, 2001).



Fig. 7  
Steep and dangerous terrain often hampers the development of infrastructure and the exchange of goods between highlands and lowlands (Kanchenjunga Region, Nepal).  
Photo: M. Kollmair



### **8.3.4 Infrastructure and information realm**

#### *Roads*

Communications, particularly road communications, are important for the development of marginal and fragile areas. Access to motorised transport has the potential to broaden economic options and is linked to economic development. However, the most remote and disadvantaged members of South Asian societies are often least able to afford motorised transport and benefit from road provision (Molesworth, 2001).

#### *Electrification*

People living in fragile areas are often excluded from the benefits of electrification. More remote and poorer populations may not be included in electrification programmes, or they may simply not be able to afford electrical energy.

#### *Information technology*

While the rapid development of information technology (IT) has brought new possibilities for global networking, trade and information exchange, poor people living in marginal areas are excluded from these opportunities by their lack of access to IT. Differentials in the extent of access to information technology are linked to unequal opportunities and exclusion from mainstream development and new livelihood options.

#### *The potential of communications*

Global networking through travel and electronic communication generates increased awareness of and participation in international trade, activities and human rights processes. It also helps raise awareness of and support for the situation of minority groups, indigenous peoples and disadvantaged groups.

### **8.3.5 Bio-physical and ecological realm**

#### *Degradation of natural resources and increasing vulnerability*

Natural resources such as land, water, forests, biodiversity and the visual quality of landscape are essential to the scope of livelihood options, the sustainability of which depends on the utilisation and regenerative capacity of natural resources. Compared with other mountain areas of the world, South Asia's mountain regions have very high human and livestock population densities. In spite of efforts to develop agriculture, the productivity of major

food crops and the reproductive capacity of natural resources are in decline. Efforts to intensify land use through technological interventions such as provision of improved breeds, chemical fertiliser and pesticides have various socio-economic and ecological implications. Although access to these technologies in marginal areas is very limited, their misuse has led to the breakdown of soil structure, increasing its acidity and reducing yields.

Deforestation and degradation of natural resources have adversely affected disadvantaged groups whose economy is based on common property resources. This has increased the work burden of women and children, who usually collect these products. The privatisation of CPR and weakening of traditional resource management systems have led to the overexploitation of certain natural resources, which has compromised sustainable livelihood options and increased vulnerability (Becker and Ostrom, 1995; SDPI, 1995; Kollmair and Müller-Böker, 2002).

## 8.4 Synopsis and syndrome contexts

### 8.4.1 Synopsis

Based on the consolidated list of research priorities, the three working groups were asked where they wanted to place the focus of their activities, keeping in mind their scientific backgrounds and regional contexts.

Within the highland-lowland syndrome context, all participants agreed that they wanted to concentrate research on the development of mitigation strategies for rural livelihoods. This consensus was based on the perception that livelihood sustainability is at stake in marginal and fragile areas, and that indigenous communities are particularly vulnerable.

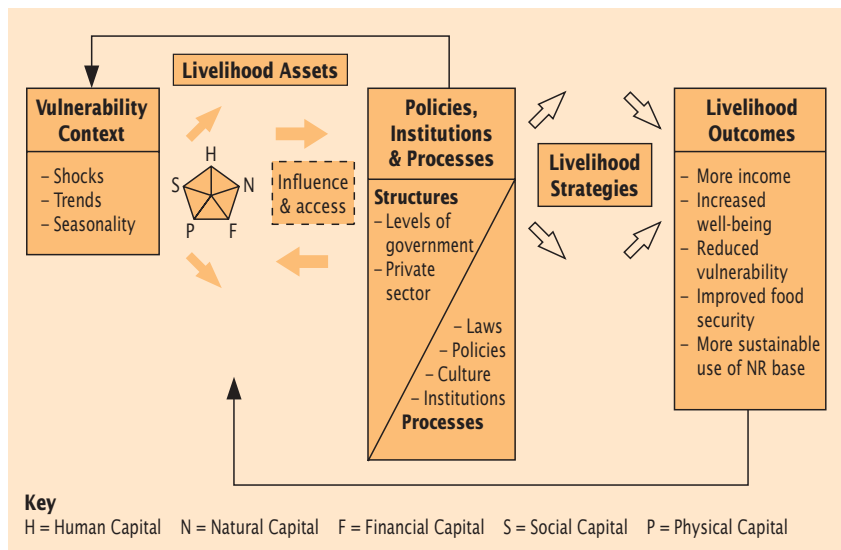


Fig. 8  
The Sustainable  
Livelihoods  
Framework.

Source:  
DFID, 2000

Given the clear focus upon livelihood issues, the Sustainable Livelihoods Framework (Fig. 8) provides a useful tool to structure the outcome of the workshop.

The issue of migration was important for all groups. Labour migration was seen as an important, but risky livelihood strategy that often links highlands

with lowlands or marginal areas with urban and peri-urban syndrome contexts. Although migration has the potential for remittances and entrepreneurial activities, this strategy is embedded in its own problem contexts, such as reducing the labour force in the villages and difficult living conditions in urban slums.

The group focusing on indigenous people regarded migration of settlers into traditionally aboriginal lands to have a negative impact on communities, as it is associated with land alienation. In-migration of “outsiders” is linked to the erosion of livelihood assets, or capitals, of indigenous people, which is another source of social and ethnic conflict. The assets of indigenous people are also negatively affected when communities are relocated, e.g. by government agencies that consider this to be a strategy for nature conservation. As people are often shifted to urban and peri-urban locations, indigenous people are faced with the difficulties of dealing with an alien syndrome context.

Participants highlighted the importance of interventions and institutions (PIPs – policies, institutions and processes) in mitigating syndromes of global change and pointed out the present lack of such PIPs in the region, particularly the poor quality of governance and the lack of effective government support at all levels. Participants dealing with India underscored the problems caused by the weakening of the state in developing countries and the withdrawal of state-run development interventions and welfare programmes. This was regarded to be a direct result of neo-liberalisation and globalisation.

All participants viewed education and empowerment, strengthening of local institutions, participatory mobilisation and decentralisation as particularly important processes with the potential to improve access to livelihood assets and ensure sustainable livelihoods. The establishment of regional cooperative networks and forums for information and employment exchange were considered to be crucial. All groups agreed that research needs to focus on the gender dimension of inequalities in income-generating opportunities (e.g. feminisation of work deprivation).

The potential of improved access to markets was regarded as crucial in providing opportunities for the poor to raise their income. Improved market access would also broaden the range of economic options, facilitating exploitation of niche markets, export of traditional commodities and a market for competitively priced labour.

It was concluded that a core problem for marginalised people lies in poor access to infrastructure, information, resources and services. This has a negative impact on various assets, notably on human capital (including health, education and nutrition) and on natural capital (unequal and contested access to land, water and forest, which in turn is associated with resource degradation). Providing access to global information networks was seen as an important opportunity to overcome the digital divide and lack of access to information and technological innovations.

#### **8.4.2 Syndrome contexts**

##### *Highland-lowland interaction*

Given the participants' consensus that activities should focus on marginalised people who are excluded from or affected by the mainstream of development, the problems and also the opportunities identified by the three working groups were quite similar. Because many marginal areas are situated in mountain regions, problem clusters may be considered as specific to the highland-lowland syndrome context. However, it became clear that even within the hill and mountain context, local and, most importantly, national circumstances exert strong influences upon livelihoods (e.g. differences in the role of the government and remoteness of particular localities).

##### *Urban and peri-urban*

This context was only considered in relation to seasonal labour migration and immigration of people from rural areas. Discussions focused on low-income jobs and the difficulties of coping with poor living conditions in the alien environment of marginal urban settlements.

## 8.5 Research status and focus

### 8.5.1 Research needs

Having identified major problems and opportunities, the workshop participants prioritised research needs and defined their research themes and groups (see Minutes of the International Workshop, 2001).

The main conclusions are the following: In the JACS South Asia there is a need for research on the impact of global change and globalisation on marginal areas and marginal people within the “highland-lowland” NCCR syndrome context and – due to its immanent interaction with the former – also the “urban and peri-urban” context. Within selected mountain areas of South Asia, the JACS South Asia will concentrate on marginal or fragile mountain areas, i.e. risk areas with regard to climatic or environmental conditions as well as the economic setting that can be positioned within the highland-lowland context, and on marginalised people.

An entry point of research in selected case study localities is the analysis of rural livelihood strategies aiming to identify key issues supporting or hampering sustainable development. As all participants emphasised migration both as a livelihood strategy and as an impact factor on livelihood assets, research on migration processes will form part of the programme. An understanding of the main processes of state policies and institutions (with reference to the selected themes of resource conservation, resource management and rural development), as well as their implementation and enforcement were regarded as vital in a livelihood analysis. The identification of global influences on selected state policies, implementation mechanisms of these policies, and related markets and economic conditions were also regarded to be important.

In some case studies, research activities will focus on the interface between rural livelihood strategies (including migration) on the one hand, and state policies and institutions on the other, under conditions of globalisation. Special consideration will be given to: (i) the role of local state and intermediary organisations, (ii) the role of local skills and knowledge, and (iii) the gender dimension.

### 8.5.2 Research contribution by members of the JACS research teams

Having identified the overall research priorities, each of the JACS research teams defined their planned research contributions. These are summarised in Table 8.

*Nepal Research Group – highland-lowland and peri-urban contexts (within IP6):*

This group’s core theme is the analysis of the following three institutional fields and their role in, and relations with, marginal people’s livelihoods:

- International labour migration and rural livelihoods: Field studies concentrate on Nepalese migrants in Delhi on the one hand, and on returnees and families remaining in Nepalese villages on the other hand. Specific attention is given to the analysis of the “transnational social space” created by these migration processes, i.e. credit systems, remittance transfer and job networks.
- The effects of nature conservation on rural livelihoods: These studies address the impacts of globalised institutional arrangements regarding nature and natural resource conservation in a local context.
- Livelihoods of marginal communities in peri-urban areas.

*Pakistan Research Group – highland-lowland interaction context (within IP6):*

The Pakistan Research Group’s core theme is to test the hypothesis that increased participation and decentralisation contribute positively to livelihoods and natural resource management (specifically forests). Overview

Table 8

Research group	Umbrella theme
Nepal	Livelihood sustainability in marginal areas
Pakistan	The impact of participation and the devolution of power on natural resource utilisation and livelihood security
Kerala	Coping strategies in the Western Ghats: Threats and opportunities of economic globalisation and state decentralisation
India/macro	Economic growth and poverty reduction in India: Effectiveness and efficiency of economic and social policies of the central government and the states
NE India and Bangladesh (within IP7)	Comparative study on conflict relations between settlers and indigenous peoples
India/urban (within IP8)	Gender, governance and environment in urban contexts of India

studies are being carried out to understand the present situation of the political decentralisation programme initiated under the Military Government, the status of forest management and the legal context of (donor-driven) trends towards joint forest management. In-depth case studies are planned to analyse the realities at field level.

*Kerala Research Group – highland-lowland context (within IP6):*

This group's core theme is the impact of globalisation on livelihoods in the marginal regions of the Western Ghats. Studies focus on the livelihoods of marginalised rural people and address the following specific issues:

- Impact of commercialisation on marginal groups.
- Market-induced changes in small-scale coir industries and their effects on marginal people's livelihoods.
- Changing prices in selected cash crops (particularly rubber) and the question of how marginal people cope with these changes.

*India Macro Research Group (within IP6):*

The goal of this group's project is to analyse the effectiveness and efficiency of economic and social policies in fostering economic growth and reducing poverty in India. Various dimensions of governance will be included in the analysis as much as possible. Economic and social policies of both the central government and state governments, as well as their impact on the livelihood of poor households, will be analysed. Due to data limitations, the analysis of policy impacts on livelihood will focus on linkages between policies and poverty (head count ratio) as measured by India's official poverty line. Poverty data have been collected since 1950 within India's National Statistical Survey (NSS) rounds.

*NE India and Bangladesh Research Group – highland-lowland context (within IP7):*

The IP7 sub-project "frontiers" works in the context of highland-lowland interaction. It investigates the nature and causes of conflicts between indigenous people and settlers in "frontier" areas of South and South East Asia, and develops strategies for their resolution. It entails field studies in four locations in the JACS South Asia:

- Assam, Kokrajhar District (North East India).
- Assam, Nagaon and Karbi Anglong Districts (North East India).
- Arunachal Pradesh (North East India).
- Chittagong Hill Tracts (Bangladesh).



*India Urban Research Group (within IP8):*

The core question of this project is to analyse whether the decentralisation process has increased women's opportunities to voice their interests, and whether it has increased state accountability towards women, especially in public services and environmental management.

**8.5.3 Institutional set-up for research  
in the JACS South Asia**

*Coordination*

Coordination of NCCR research in the JACS South Asia is within IP6 (Development Study Group, Department of Geography, University of Zurich, Switzerland). In its 4-Year Plan and 1-Year Plans, IP6 has defined one Activity Line specifically for this purpose. Appropriate arrangements for research coordination, planning, administration, monitoring and reporting are being defined.

*JACS Secretariat*

IP6 has established a JACS Secretariat in Nepal called "NCCR South Asia Office" (Ekanatakuna, Jawalakhel, G.P.O. Box 910, Kathmandu, Nepal, [nccr@wlink.com.np](mailto:nccr@wlink.com.np)).

Table 9

IP	Group Name	Partner Institution	Link Institution in the North
IP6	Nepal Research Group	Central Department of Geography (CDG), Tribhuvan University, Kathmandu Nepal Institute of Development Studies (NIDS)	Development Study Group, Department of Geography, University of Zurich
IP6	Pakistan Research Group	SDPI (Sustainable Development Policy Institute), Islamabad Journalists for Democracy and Human Rights (JDHR), Islamabad	Development Study Group, Department of Geography, University of Zurich
IP6	Kerala Research Group	Centre for Development Studies (CDS), Thiruvananthapuram, Kerala	Development Study Group, Department of Geography, University of Zurich
IP6	India Macro Research Group	Institute of Economic Growth, Delhi School of Economics Gujarat Institute of Development Research, Ahmedabad	Post-Graduate Course on Developing Countries (NADEL), Swiss Federal Institute of Technology, Zurich
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## 9 JACS South East Asia Improving Living Conditions through Integrated Environmental Management

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Fig. 1  
Open canal heavily  
polluted by liquid  
and solid wastes  
in the city of  
Kunming, Yunnan  
Province. Poor  
environmental  
sanitation has  
become one of the  
main problems in  
the fast-growing  
urban areas of the  
Greater Mekong  
Subregion.  
Photo:  
R. Schertenleib,  
March 2002

\* On behalf of all the participants of the workshop in Hanoi, Vietnam, of 21–23 August 2001 (listed in Annex 1, p. 452)



## **Abstract**

The case studies in the JACS South East Asia address key issues in the six countries of the Greater Mekong Subregion (GMS), which has a total population of 240 million people. Together, the lands of the GMS cover some 2.3 million km<sup>2</sup>. The GMS is a vast area that possesses an enormous wealth and variety of natural resources. This rich resource endowment has made the region a new frontier of Asian economic growth. Indeed, the Mekong region has the potential to be one of the world's fastest-growing areas. While traditional lifestyles and deep-rooted customs and beliefs have been scarcely altered by the passage of time, the area is now undergoing greater change than ever before. During a workshop held in Hanoi in August 2001, lack of access to adequate environmental sanitation services was identified as one of the key problems in the urban and peri-urban context; this problem needs to be addressed by the NCCR North-South in future research activities. In both the highland and the highland-lowland contexts, overexploitation of natural resources – mainly in the form of deforestation – was identified as one of the main issues. Research activities in this syndrome context will focus on the development of mitigating strategies in the case of conflicts between slash-and-burn farmers in the hills and rice farmers in the valleys. This research will also examine the spatial distribution of forms and levels of poverty in the uplands, systems of land conservation and the political decision-making process related to conservation of forests.

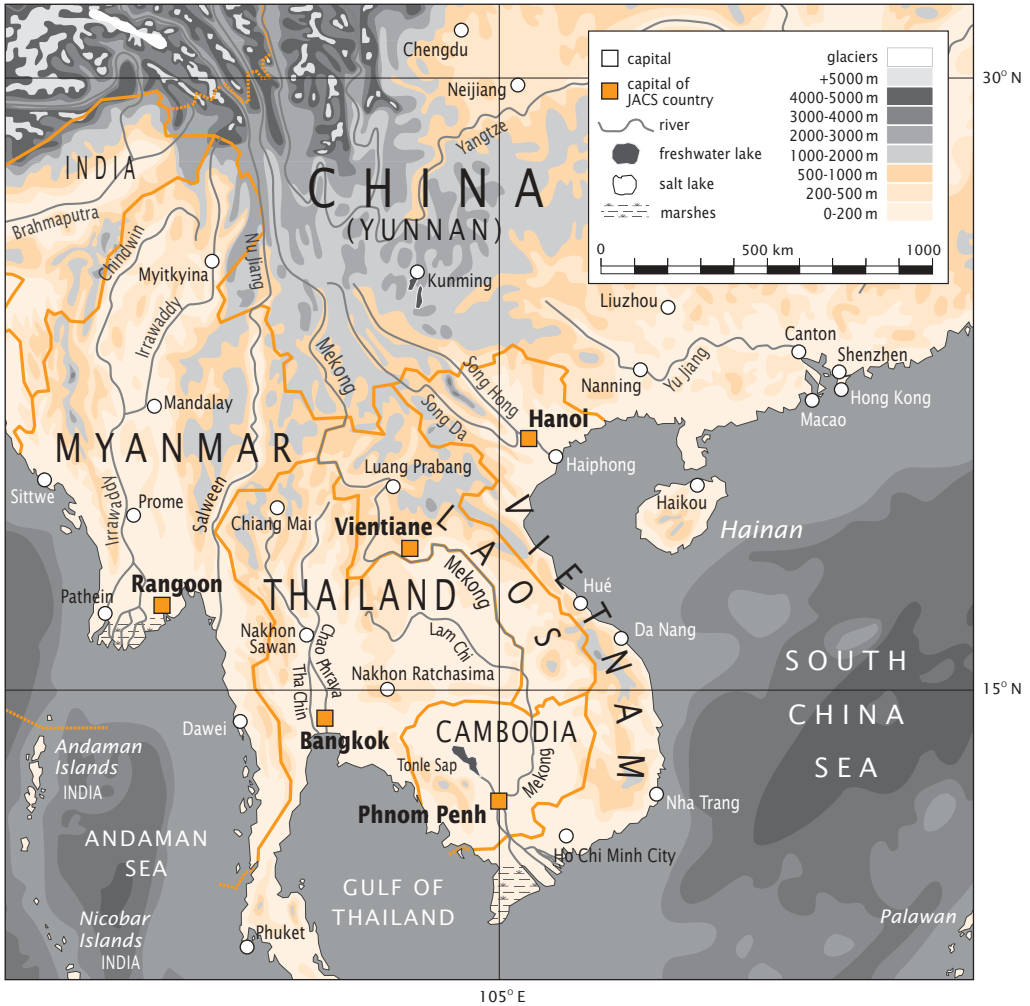


Fig. 2: JACS South East Asia – The Greater Mekong Subregion. The case studies in the JACS South East Asia address key issues in the six countries of the Greater Mekong Subregion: Cambodia, China (Yunnan Province), Laos, Myanmar, Thailand and Vietnam. The case studies look at urban and highland-lowland contexts from social, political, economic and ecological perspectives.

## 9.1 Introduction to the JACS South East Asia region

The Greater Mekong Subregion (GMS), with a population of 240 million people, covers six nations: Cambodia, China (Yunnan Province), Laos, Myanmar, Thailand and Vietnam. The Mekong River either forms a boundary of these countries or flows through their territory.

Together, the lands of the GMS cover some 2.3 million km<sup>2</sup>. The GMS is a vast area possessing an enormous wealth and variety of natural resources, including a rich agricultural base, timber, fisheries, minerals and energy in the form of hydropower and coal and petroleum reserves. These resources fuel economic development and support rural livelihoods in an interrelated fashion. Water from the Mekong River supports agriculture, and its fish yields are a source of both protein and income. The river is also used to generate electricity and serves as a transport corridor. Forests in the Mekong region protect hydropower projects and agriculture from siltation and soil erosion, contribute to tourism potential, and provide subsistence to rural communities in the form of food, medicinal plants, fuelwood and other non-timber products.

The great majority of the people in this region live in rural areas where their lifestyles are based on subsistence or semi-subsistence agriculture. More than 75 % of the population of the Lao PDR, for example, is rural. Even Thailand, the most urbanised of the Mekong countries, has large agricultural communities, particularly in the north and north-eastern parts of the country.

While traditional lifestyles and deep-rooted customs and beliefs have been scarcely altered by the passage of time, the area is now undergoing greater change than ever before. With the onset of peace in the 1990s, the peoples of the Mekong region have begun to experience rapid changes and improvements in their standard of living. Increasingly, modernisation and industrialisation are emerging from a process of transition and transformation. The Mekong countries are gradually shifting from subsistence farming to more diversified economies and to more open, market-based systems. Concurrently, commercial relations among the six Mekong countries are increasing, notably in terms of cross-border trade, investment and labour mobility. Moreover, natural resources, particularly hydropower, are beginning to be developed and utilised on a subregional basis.

The key performance indicators for Mekong countries are given in Table 1. The gross domestic product (GDP) per capita is about USD1 per day in most of the region. Despite significant economic growth, poverty is still widespread. The region is also characterised by disparities between urban and rural communities, a growing gap between rich and poor, inadequate attention to the special needs of ethnic minorities, gender inequities, lack of access to basic health and education, and inadequate protection of the environment on which traditional livelihoods depend.



Fig. 3

Family fish farm near the Tha-chin River in Thailand.

Small and medium-size fish and shrimp farming, which depend on good surface water quality, are the basis of traditional livelihoods in many parts of the Greater Mekong Subregion.

Photo: R. Schertenleib, March 2003

Table 1

Some key indicators for the countries in the JACS South East Asia.

	Year	Cambodia	China	Lao PDR	Myanmar	Thailand	Vietnam
<b>Geography and social indicators</b>							
Surface (thousand sq. km)	2000	181	9598	237	677	513	332
Total population (million)	2000	13.1	1275.1	5.3	47.7	62.8	78.1
Annual population growth rate (%)	1990–2000	2.7	1.1	2.6	1.2	0.9	1.7
Urban population (% of total population)	2000	–	32	24	–	22	24
Annual urban growth rate (%)	1990–1995	6.5	3.8	6.5	3.3	2.3	3.1
<b>Development and economic indicators</b>							
GDP per capita, at purchasing power parities (USD)	2000	1446	3976	1575	–	6402	1996
HDI rank (total 173)	2002	130	96	143	127	70	109
Human Poverty Index (% of population below poverty line)	1989–2000	36.1	4.6	46.1	–	13.1	50.9
Population in agriculture male / female (% of labour force)	1980–1982* / 1998–2000	–	–	77/82*	–	50/47	–
Public expenditure on education / health (% of total public expenditure)	1995–1997/1998	2.9/0.6	2.3/2.1	2.1/1.2	1.2/0.2	4.8/1.9	3.0/0.8
Population with access to safe water/adequate sanitation (%)	2000	30/18	75/38	90/46	68/46	80/96	56/73
<b>Environmental indicators</b>							
Crop land per capita (hectares)	1997–1999	0.32	0.1	0.17	0.21	0.25	0.04
Area of severe soil degradation (% of country)	2000	49	35	1	36	78	88
Protected area (% of total surface)	1999	16.2	6.4	0	0.3	13.9	3.1
Energy consumption per capita (kilogram of oil equivalent)	1999	–	868	–	273	1169	454

Sources:  
UNDP, 2002;  
World Bank,  
2002a+b;  
FAO, 2000

## **9.2 Identification of core problems according to syndrome context**

### **9.2.1 Current problems**

As previously mentioned, the Greater Mekong Subregion is rich in natural resources and human culture. This rich resource endowment has made the region a new frontier of Asian economic growth. Indeed, the GMS has the potential to be one of the world's fastest-growing areas. But population growth and economic growth in particular are putting its unrivalled natural environment at great risk. The economic logic that made geographical boundaries useful lines of demarcation has effectively disappeared. The people of the GMS have collectively become heavily dependent on the region's shared natural resource base for their livelihood.

The countries in the GMS are striving to alleviate poverty, minimise disparities in resource distribution, manage natural resources and protect the natural environment. In addition, foreign donors, governments, and international organisations are attaching environmental requirements to projects, in accordance with the principles of sustainable development. Nevertheless, all national institutions involved in trying to minimise environmental problems and build a well-managed society have been hampered by numerous setbacks. The most critical of these include the following:

1. Policy and regulatory frameworks that are inadequate for integrating environmental-economic planning.
2. Centralised decision-making and command over public services, infrastructure and the natural environment.
3. Inadequate databases and funding to support sound decision-making.
4. Ineffective design, enforcement and monitoring of policy implementation.

In the absence of sound management, economic growth and infrastructure development in the region can be expected to put further stress on natural resources, water quality and quantity and ecosystem integrity.

The core problems differ from nation to nation and region to region, depending on various factors. Selection of problems and projects to be developed depends on the area envisaged and on local, national and regional interests. During a workshop held in Hanoi, Vietnam, from 21 to 23 August 2001, a group of 28 experts from Cambodia, Laos, Thailand, Vietnam and Switzer-

land, working in different fields, identified a list of core problems in the urban and peri-urban syndrome context as well as in highland-lowland areas, and rated them according to their importance and urgency.

### 9.2.2 Identification of core problems in the urban and peri-urban context

As in most parts of the developing world, the countries of the Greater Mekong Subregion are facing serious and growing problems related to rapid population increase in urban agglomerations. The full list of core problems identified by the participants in the Hanoi workshop for the urban and peri-urban context is given in Table 2. These core problems were assigned to the 5 major scientific realms, which include political and institutional issues, socio-cultural and economic issues, population and livelihood issues, infrastructure and land use issues, and bio-physical and ecological issues.

Table 2

No.	Problem	Weighting
<b>1. Political and institutional realm</b>		
1.	Poor governance	6
2.	Weak leadership	6
3.	Lack of coordination between stakeholders; lack of coordination between sectors	6
4.	Inadequate municipal management capacity; mismatch between institutions and the socio-economic and environmental realities they are trying to manage	6
5.	Insufficient coordination of river water resource management (see No. 61)	6
6.	Inadequate legal framework for municipal management (over-centralisation)	5
7.	Poor regulations; lack of enforcement of existing regulations leads to degeneration of facilities and conditions	5
8.	Inappropriate environmental sanitation strategies with over-centralised systems and poor allocation of responsibilities	5
9.	Ineffective urban planning	5
10.	Inappropriate and discriminatory policies on urban migration (e.g. residential registration – see No. 34)	5
11.	Insufficient participation of the population in policy and planning decisions	5
12.	Lack of linkage between urban and rural development policies	5
13.	Inadequate strategy and planning at the national and international levels	4
14.	Poor cost recovery from service systems; high “administrative” water losses due to non-payment for consumed water	4
15.	Lack of groundwater protection in urban areas; no control of well construction	4
16.	Solid waste management: over-centralised, inadequate composting and recycling	3

Table 2  
(continued)

No.	Problem	Weighting
<b>2. Socio-cultural and economic realm</b>		
17.	Commercially driven development is undermining traditional values and respect for education (in Laos)	6
18.	Growing “floating” population of seasonal and daily migrants (see No. 34)	6
19.	Urban migration; uncontrolled growth in urban periphery	6
20.	Young people search for work instead of continuing their education	5
21.	Shortage of technicians – great gap between engineers and unskilled workers	5
22.	Social problems and urban violence (crime, prostitution, drug abuse, etc.)	5
23.	Unemployment and, more frequently, under-employment	5
24.	Inadequate access to social services and infrastructure (affordability, etc.)	5
25.	Poor cost recovery from service systems (see No. 14)	4
26.	Inappropriate understanding among the population of water as a scarce resource	4
27.	Trained people are drawn to large cities, aggravating the shortage of human resources in small towns and villages	4
28.	Increasing socio-economic disparity between urban and rural populations	4
29.	Development gap between urban and peri-urban areas and between different cities	4
30.	Changing social values – family, tradition, culture – and possible loss of identity	4
31.	Lack of social responsibility on the part of government and citizens	4
32.	Growing social and spatial segregation in urban areas	3
<b>3. Population and livelihood realm</b>		
33.	Migration and associated problems for populations concerned, caused in part by inappropriate attempts to control migration (see No. 9)	6
34.	Growing “floating” population of seasonal and daily migrants (see No. 18)	6
35.	Urban migration and uncontrolled growth at urban periphery (see No. 19)	5
36.	Inadequate and poor quality housing; growth of slums	5
37.	Poverty	5
38.	Poor access to public health facilities	4
39.	Inadequate food security and safety	4
40.	Insecure land tenure	4
41.	Relocation and resettlement causes hardship and interrupts the livelihood of populations affected	4
42.	Lack of gender balance; lower status of women	4
43.	Public health problems	3
44.	Aesthetic problems related to environmental degradation and poor living conditions	3
45.	Lack of awareness of public health risks and environmental sanitation (see No. 65)	3
<b>4. Infrastructure and land use realm (part 1)</b>		
46.	Poor environmental sanitation	7
47.	Flooding and associated economic and social problems	6
48.	Mounting transportation problems; congestion; inadequate road network, rising volume of private vehicles; lack of public transportation facilities	6
49.	Lack of safe drinking water supply	6

(continued p. 272)



Table 2  
(continued)

No.	Problem	Weighting
<b>4. Infrastructure and land use realm (part 2)</b>		
50.	Inappropriate sanitation technology	5
51.	Inefficient and conflicting land uses due to ineffective urban planning	5
52.	Poor management of local sanitation systems, particularly septic tanks	5
53.	Inadequate waste and wastewater management in rapidly growing cities	4
54.	Poorly developed environmental sanitation systems; inappropriate, unaffordable solutions; waste of resources	4
55.	Problems in selecting suitable technology for wastewater treatment	4
56.	High level of physical water losses in the distribution system	4
57.	Lack of groundwater protection in urban areas; no control of well construction	4
58.	Salt water infiltration in coastal cities	4
59.	Loss of historical urban areas; lack of financial resources for their conservation and restoration	4
60.	Solid waste management: over-centralised, inadequate composting and recycling	3
<b>5. Bio-physical and ecological realm</b>		
61.	Poor river water quality due to inadequate resource management (see No. 5)	6
62.	Poor quality of ground and surface water	6
63.	Pollution of surface and groundwater by residential and industrial use	6
64.	Inappropriate disposal of the growing volume of waste and hazardous waste	6
65.	Lack of environmental awareness (see No. 45)	6
66.	Air pollution	5
67.	Land encroachment	5
68.	Import of environmentally inappropriate technology	5
69.	Degradation of natural resources in rural areas, contributing to increasing urban problems	4
70.	Trans-border pollution between Mekong countries	4
71.	Import of waste from developed countries	4
72.	Urban growth in ecologically sensitive areas (e.g. wetlands)	3

The outcome of the weighting of certain core problems gave rise to considerable discussion. Indeed, the assigned weightings do not always appear logical. For example, “poverty” (No. 37) received a lower weighting than “migration” (Nos 18, 19, 33, 34, 35), although it appears to be a more fundamental problem. To take another example, “public health” (No. 43) was considered a less significant problem than “access to health facilities” (No. 38).

There are several possible reasons for this. First, it is clear that a great number of problems had to be assessed very rapidly, and during the workshop there was not enough time to “re-calibrate” the scoring used at different points in the process. Furthermore, the group dynamics of scoring differed considerably between the two working groups; one group obviously gave a higher percentage of lower scores than the other group. There was some ten-

endency to give general problems a greater weighting than specific problems. Thus “environmental sanitation” (No. 46) was given the highest possible weighting, while various components of environmental sanitation – water supply, wastewater treatment and waste collection – received lower scores. Another possible explanation for the apparent anomalies is that participants assessed problems from different perspectives. While some asked: a) How serious is the issue or problem in itself?, others were likely to ask: b) How seriously does the problem affect the particular context?, or: c) How important and relevant is the problem to our work? Of course, the intended perspective would be close to “b”. It appears, however, that perspectives “a” and “c” also played a role. To take the example of poverty, some believed it to be the most important problem (“a”), while others – mainly the Vietnamese – saw poverty as a more relative phenomenon and felt that it was not a very serious problem in the local context (“b”).

Another issue that gave rise to considerable controversy was migration. Although migration was widely held to be a serious problem, some participants felt that migration as such was not really the problem. Indeed, migration may even be a solution to problems caused by structural change in the economy. Problems relating to urban migration seemed to be perceived in three different ways: 1) inadequate response to the needs of migrants, such as the failure to provide land, housing and services (No. 36); 2) inadequate controls and regulations, leading to uncontrolled urban growth at the periphery (No. 35); and 3) inappropriate and discriminatory controls and regulations (e.g. residential registration), which makes it more difficult for migrants to integrate into the local economy and obtain needed services (No. 10). Finally, as participants pointed out in the plenum discussion, urban migration is basically a problem of urban-rural linkages. It has both positive and negative consequences for rural as well as urban areas. This aspect has not yet been given adequate attention in terms of problem formulation.

### **9.2.3 Identification of core problems in the highland and highland-lowland contexts**

Participants in the Hanoi workshop also identified and weighted core problems in the syndrome context of highland areas and relationships between highland and lowland areas. The core problems identified are listed in Table 3.

While most of the heavily weighted problems arise in highland areas, the most serious aspect in about one-quarter (6) of the cases is the relationship between

highland and lowland areas, rather than conditions in the highlands themselves. These key “relationship” problems concern: government policies (No. 5); poverty (No. 13); gender inequality (No. 15); substance abuse (No. 17); water resource allocation (No. 22); and water quality (No. 25). The highland group paid considerable attention to problems related to the transformation from a centrally controlled political economy to a market system. This affects Vietnam and Laos in particular. In Thailand, the problems of globalisation are more acute – particularly those related to the internationalisation of capital.

Table 3

Highland and highland-lowland context: core problems and their weighting.

No.	Problem	Highland		Highland – lowland	
		Aver.	Spec.	Aver.	Spec.
<b>1. Political and institutional realm</b>					
1.	Decentralisation of responsibilities and duties without decentralisation of authority and access to resources	6	4 Vietnam	4	
2.	Difficulties arising from transition from central planning to a market-oriented economy, and from globalisation and the internationalisation of capital	6	5 Thailand	6	2 Thailand
3.	Existing laws, regulations and policies not consistently enforced	6		5	
4.	Lack of people’s participation in decision-making	6		5	
5.	Uncoordinated and inappropriate government policies and development activities	5		6	
6.	Unclear citizenship status (lack of citizenship) among indigenous people in border regions	2	6 Thailand	1	5 Thailand
<b>2. Socio-cultural and economic realm</b>					
7.	Social and ethnic conflicts over resource use (land, forests, water, minerals)	6	4 Laos	5	4 Laos 6 Thailand
8.	Indigenous institutions, rights, regulations and knowledge are unrecognised or lost	6	7 Cambodia	4	
9.	Poor and unequal access to training, extension services, credit, etc.	6	4 Thailand	4	6 Vietnam
10.	Lack of access to adequate basic services (health, education, etc.)	5	6 Laos	4	6 Vietnam
11.	Lack of access to markets; limited integration into market systems	5	3 Thailand	4	2 Thailand
12.	Incompatibilities of knowledge systems and attitudes among (lowland) decision-makers and (highland) populations – reinforcing an inferiority complex among highland peoples	4		4	
<b>3. Population and livelihood realm</b>					
13.	High levels of poverty and livelihood insecurity, particularly among people engaged in subsistence production	5	6 Laos, Cambodia	6	

Table 3  
(continued)

No.	Problem	Highland		Highland – lowland	
		Aver.	Spec.	Aver.	Spec.
14.	Insecure land tenure systems	5	6 Thailand	4	3 Laos 5 Thailand
15.	High level of gender inequality	5		4	6 Vietnam
16.	Health problems, vulnerability and risks	5		4	
17.	High incidence of sexual and drug abuse; human trafficking	4	6 Thailand 2 Cambodia	4	6 Thailand
18.	High rates of internal and international migration (rural-rural, rural-urban, urban-rural and urban-urban)	5	4 Thailand	4	
19.	High population growth	4	3 Thailand		
<b>4. Infrastructure and land use realm</b>					
20.	Inappropriate infrastructure solutions, inadequate maintenance and poor access to infrastructure services (esp. transportation, energy, irrigation)	6	4 Thailand	5	2 Thailand
21.	Overuse and misuse of land and forest resources – often driven by lowland interests – resulting in degradation and loss of wildlife	5		4	
22.	Ineffective and inequitable use and allocation of water resources (including irrigation) driven by lowland interests	3		5	4 Laos 6 Vietnam
<b>5. Bio-physical and ecological realm</b>					
23.	Rapid degradation of land and destruction of forests (caused partly by fire)	5	4 Thailand	4	5 Thailand
24.	Loss of biodiversity	5		5	
25.	Water resources subject to excessive fluctuation (i.e. flood, drought) and deteriorating quality (i.e. pollution and sedimentation)	4		5	

A number of critical problems in highland areas relate to the clash between the subsistence economy and the lowland-dominated (capitalist) market economy, whose interests (timber, water, etc.) often extend into highland areas. In addition to economic problems, highland-lowland interactions give rise to socio-cultural problems (threats to indigenous “identity”) and problems related to social services (loss of traditional forms; inappropriateness of state service systems, etc.). Access to services is limited not only by their shortage but also by the fact that their form (and even the language used) is often poorly adapted to local needs.

At the bio-physical level, the problem of forest fires drew particular attention.

## 9.3 Status and dynamics of core problems

The core problems given the highest weightings during the Hanoi workshop (Tables 2 and 3) are discussed in greater detail in the following sections.

### 9.3.1 Status and dynamics of problems related to the non-sustainable use of freshwater resources

Rapid population and economic growth have had great impacts on the region's freshwater resources, affecting urban and peri-urban as well as highland areas, and the relationship between highland and lowland areas.

As in many other parts of the world (Zehnder et al., 2003), the development and management of water resources in the Greater Mekong Subregion affects the full spectrum of freshwater ecosystem services. Dams and reservoirs, coupled with extensive deforestation in some watersheds, have reduced stream water levels, lowered water tables, degraded riparian wetlands, diminished freshwater aquatic diversity and increased the severity of floods. Water quality has steadily declined, degraded by sewage, industrial effluent, urban and agricultural runoff and saline intrusion. Nutrient loading from agricultural runoff and sewage has worsened water quality to the extent

Fig. 4  
Side canal of the  
Tha-chin River in  
Thailand. Water  
quality has been  
heavily degraded  
by agricultural  
runoff (i.e. from  
pig, duck and  
chicken farms)  
and by untreated  
human excreta.  
Photo:  
R. Schertenleib,  
March 2003



that eutrophication of surface water is now a serious problem in many rivers and canals.

The region's rapidly developing economy requires an increased volume of water to support demands related to agriculture, industry, energy production, and rural and urban households and services. Water use is also affected by other sectors. For example, in Vietnam upland forestry practices (clearing, road building) are leading to increased erosion and sedimentation. This also increases downstream flood risks by diminishing the water retention ability of soils, which in turn alters the hydrological cycle. The range of environmental problems associated with non-sustainable use of water resources is depicted in Fig. 5.

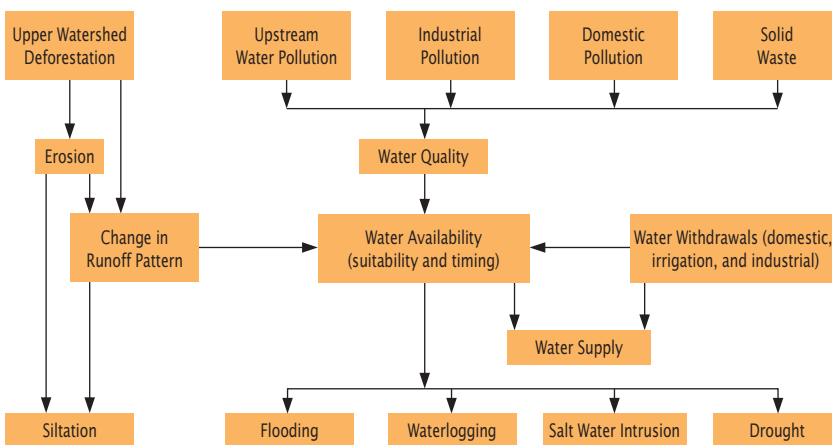


Fig. 5  
Problems  
associated  
with freshwater  
withdrawals.

### 9.3.2 Status and dynamics of core problems in the urban and peri-urban context

#### *The problems of urbanisation*

In the Mekong countries, as in most other parts of the developing world, the last few decades have been characterised by important changes and irreversible trends involving natural, technological, social, economic and political factors. One of the most striking differences observed within the last 25 years is the fast increase of people and economic activity in urban and indus-

trial centres (Fig. 6; UNDP, 2001). This ongoing transition from rural life to city life represents a large-scale, permanent demographic shift with major impacts on extraction and depletion of natural resources, the environment and livelihoods.

Cities require vast quantities of resources – both for their inhabitants and for the economic activities clustered there (World Resources Institute et al., 1996). Urbanisation, industrialisation and economic development are therefore exerting great pressure and demand on land and natural resources, most notably on freshwater resources. Fortunately, the amount of renewable water resources (annual precipitation) in the GMS is relatively high, so that the region is not facing acute water shortage problems. Fig. 8 compares freshwater withdrawals in the Mekong countries with internal renewable water resources (UNDP, 1999).

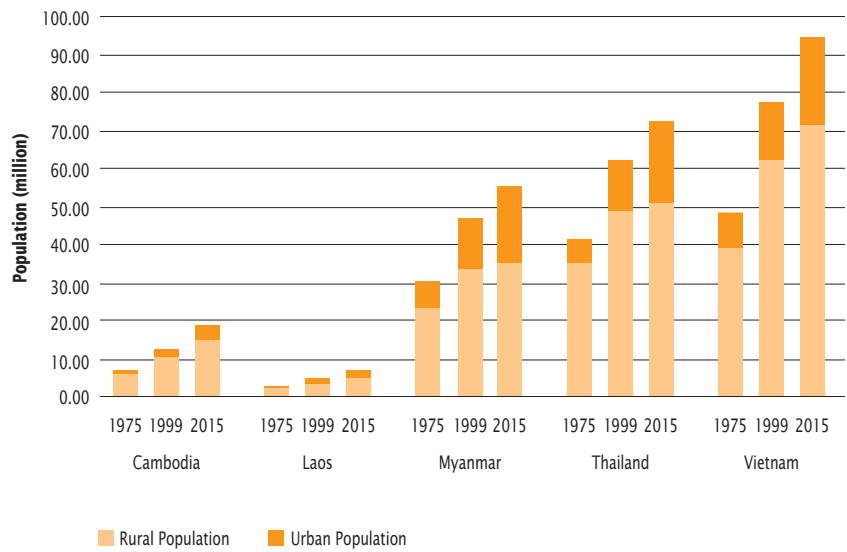


Fig. 6  
Development of  
urbanisation in the  
Greater Mekong  
Subregion.

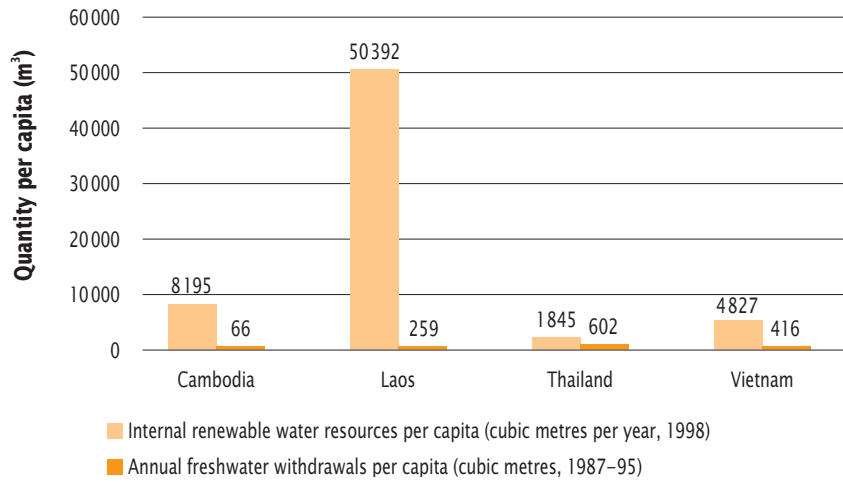


Fig. 7  
Dianchi Lake  
in Yunnan  
Province, China.  
Urbanisation,  
industrialisation,  
and economic  
development are  
exerting great  
pressure on  
surface waters  
and freshwater  
resources.

Photo:  
R. Schertenleib,  
March 2002



Fig. 8  
Freshwater  
withdrawals  
compared to  
renewable  
water resources.



Many cities are already facing critical environmental degradation. This is mainly the result of improper waste disposal, which leads to contamination of rivers, streams and groundwater, the extraction of water from diminishing aquifers, and a long list of service management deficiencies. Indeed, the lack of adequate environmental sanitation is the most severe environmental problem in many parts of the region. The status and dynamics of this particular problem will be discussed in detail in later paragraphs.

Many of the newcomers in urban areas end up in settlements where municipal investments in services – roads, water supplies and environmental sanitation – are negligible or non-existent. A proliferation of slums, heavy traffic congestion, unprecedented degradation of air quality, uncontrolled industrial growth, threats to public health from water pollution, poor drainage and solid waste disposal practices are becoming more and more serious in the urban agglomerations of the Mekong countries. The impacts of pollution, wastefulness and mismanagement fall most heavily on the urban poor. However inadequate the main services may be, the middle- and upper-income segments of the population with household connections typically receive heavily subsidised services adequate for healthy living. But in the slums and shantytowns there are frequently no services at all (Black, 1996).

*Lack of access to safe drinking water and adequate sanitation services*

According to the latest statistics, a significant proportion of the urban population in the countries of the GMS has no access to safe drinking water (WHO

et al., 2000). For instance, in Vietnam alone, almost 3 million urban dwellers have no access to safe drinking water. The lack of an adequate water supply not only impairs health but also slows economic development. From the point of view of public health, the situation is even more serious with regard to sanitation. It is noteworthy that the situation with respect to water supply and sanitation actually worsened over the last 10 years, despite the fact that the sector has received considerably more attention in recent years. Especially in urban areas, the absolute number of inhabitants without access to safe drinking water and adequate sanitation was higher in 2000 than in 1990.

With regard to water supply in urban areas, many water utilities have been fighting a desperate battle to provide functional service in the face of increasing demand. As the quantity of available drinking water decreases (due to increasing competition among different water uses) and the quality declines, disruptions of existing systems become more acute. A vicious cycle develops in which service is so poor that costs cannot be recovered from users and the income generated is so low that the service cannot be improved.

As in many parts of the developing world, poor environmental sanitation is the most severe environmental problem in the GMS, affecting the living conditions of millions of people. Poor sanitation poses various health hazards, including direct exposure to faeces near homes, contaminated drinking water, ingestion of fish from polluted waters and ingestion of uncooked vegetables irrigated by untreated wastewater. Inadequate access to water and sanitation facilities is actually the main cause of intestinal diseases transmitted by faeces, which are prevalent in the countries of the Greater Mekong Subregion.

In light of the growing numbers of urban inhabitants who do not have access to adequate water, sanitation, drainage and solid waste disposal services, it is clear that a large proportion of humanity has failed to gain access to conventional urban environmental sanitation. Poor planning lies at the heart of current shortcomings in interventions dealing with environmental sanitation (EAWAG/SANDEC and WSSCC, 1999). Too often, environmental sanitation professionals give only lip service to environmental management issues, and services are not conceived in an integrated way that takes into account all their potential impacts. For example, provision of water without allowing for the removal of wastewater may create standing water, thereby outweighing positive benefits. The need for holistic and integrated planning has been insufficiently recognised (Schertenleib, 2000).

Fig. 9

Urban farmers washing vegetables in a heavily contaminated canal in Kunming before bringing them to market. The lack of adequate environmental sanitation leads to contamination of freshwater resources and poses various health hazards. Photo: D. Forster, August 2002



There has also been a tendency to develop systems that respond to problems of environmental waste management as perceived by policy makers and professionals, rather than to the actual needs of households and communities (Schertenleib and Gujer, 1999). Decisions on interventions – especially those requiring sophisticated technology such as sewerage – are commonly taken at a political or administrative level far removed from the people to be served. This frequently results in the refusal of the supposed users of services to accept operational responsibility, thereby jeopardising service sustainability. In order to promote user ownership of services, decisions should be taken at a level as close as possible to the source of the problem, in consultation with the people most directly affected.

Therefore, on grounds both of human need and better environmental management, it is important for the environmental sanitation community to radically re-direct its thinking. Any vision of environmental sanitation for the 21st century needs to identify efficient, sustainable and cost-effective methods that have the capacity to balance improvements in the quality of people's lives with the well-being of the environment (EAWAG/SANDEC and WSSCC, 1999; Schertenleib, 2000).

### **9.3.3 Status and dynamics of selected core problems in the highland and highland-lowland contexts**

Highland-lowland interactions are especially crucial in many parts of the GMS, as they concern the same river system, namely the Mekong River basin.

Overexploitation of natural resources – primarily in the form of deforestation, especially in the upper zones of watersheds – is one of the main issues in both the highland and highland-lowland contexts. In the Lower Mekong Basin, which covers large portions of the GMS, the forest cover declined from 50% to roughly 25–32% (depending on the sources) from the 1970s to the mid-1990s (Hiroshi, 2000). Besides this reduction in the area covered by forests, the quality (in terms of biomass density) of remaining forest has also been decreasing steadily (MRC and UNEP, 1997). Together with a significant increase in hydropower and reservoir structures, and the augmented water demand resulting from intensified irrigation agriculture, greater impacts on flow regime, siltation rate, and extent and duration of floods can be expected in future.

The example of annual floods in the Mekong River systems highlights the vulnerability of the lowlands with regard to changes in the highlands, and thus stresses the importance of proper management of the complex highland-lowland system in a transboundary context. In the Mekong Delta and the Cambodian floodplains, floods periodically cause damage to infrastructure and crops on over 2 million hectares of land. The silt deposited is crucial for the ability of farmers to produce the rice that feeds much of the downstream areas. Floods also play a crucial role in maintaining agriculture productivity and livelihood security by flushing out saline water that intrudes up through the Mekong Delta. Inland fisheries, which provide almost 80% of the protein consumed in Cambodia, are similarly vulnerable to fluctuations in the annual flood regime and to changes in sedimentation loads (Badehoch, 2002).

Mountain areas in the Greater Mekong Subregion are under increasing land use pressure. The intensity of commercial logging and shifting cultivation has increased in recent years, due to inappropriate land use policies, migration and resettlement, and a growing population that is faced with the challenge of deriving its livelihood from a limited and increasingly undermined resource base.

## **9.4 Synopsis and syndromes**

### **9.4.1 Synopsis and syndromes in the urban and peri-urban context**

Besides general political and institutional problems such as poor governance, weak leadership, inadequate municipal management capacity, and lack of coordination between stakeholders and sectors, most of the heavily weighted problems in urban and peri-urban areas are related to (a) poor sanitation (lack of safe drinking water, inappropriate disposal of municipal liquid and solid wastes, flooding due to lack of storm water drainage), resulting in deteriorating quality of surface and groundwater; and (b) urban migration and uncontrolled growth at the urban periphery. Many of these problems are closely interrelated and appear in different combinations.

### **9.4.2 Synopsis and syndromes in the highland and highland-lowland contexts**

Analyses of core problems in the Greater Mekong Subregion (GMS) clearly indicate the relevance of a highland syndrome context as well as a highland-lowland syndrome context. The former is characterised by increasing pressure on natural resources in watersheds, problems of livelihood security among large parts of the highland population and limited policies to cope with these problems. The latter is characterised by the heavy dependency of the lowlands on the use of the highlands, especially in relation to the complex potentials and problems of floods and of living with them.

Assessment of the core problems of non-sustainable development in the GMS has, however, also shown that the two syndrome contexts – highlands and highland-lowland interactions – must be further differentiated along national boundaries. The countries of the GMS share a number of attributes, but still represent great diversity in terms of aspiration, stages of development, resource endowment, political economy and bilateral relationships with their neighbours. This is also reflected in how core problems are perceived by representatives of the different nations (Table 3), leading to differentiations among the selected syndrome contexts.

## 9.5 Research status and focus

After identifying and weighting core problems, the second major task of the Hanoi workshop was to formulate possible research themes. In principle, these themes were to constitute a response to the problems identified, aiming at resolution or mitigation.

Priority was given to two criteria – “importance” and “urgency” – which were combined into one scale as follows:

Table 4

	Urgent	Less urgent
Very important	1	2
Important	3	4
Less important	5	6

Priority criteria used in last column of Tables 5 + 6.

### 9.5.1 Proposed research themes

The proposed research themes in the two syndrome contexts, their realm and their assigned priority are shown in Tables 5 and 6, respectively (see Tables 2 and 3 for realm enumeration).

Table 5

Title	Realm	Priority
Integrated environmental management for sustainable development of urban areas in the Mekong Region	4	1
Environmental sanitation technologies for peri-urban communities in the Mekong Region	4	1
Transportation and traffic congestion: alternative solutions for cities in the Mekong Region	4	2
Study of the scientific basis for integrated management of the quality of running water	5	2
Capacity building for efficient urban management in the Mekong Region	1	2
Establishing the scientific basics of an environmental pollution control strategy for urban areas in Vietnam	1	2
Improved urban transportation systems – the case of Hanoi	4	3
Public environmental awareness – a tool for effective waste management	2	3

Proposed research themes: urban and peri-urban context.

(continued p. 286)

Table 5  
(continued)

Title	Realm	Priority
Enhancing environmental management capacities in urban areas in the Mekong Region	1	3
Information flows and decision-making processes in urban management – their impact on the sustainability of infrastructure systems	1	3
Strengthening the participation of urban actors in urban planning – the case of Ho Chi Minh City (HCMC)	1	3
Study of appropriate measures for supplying safe drinking water for people in flooded areas of the Mekong Delta	4	3
Urban farmers: strengthening urban agriculture to enhance urban, regional and national food security and livelihood	3	4
Selection of appropriate technologies for municipal wastewater management in urban areas of the Mekong Region	4	4
Integration of environmental sanitation – liquid and solid waste management and urban agriculture	4	4
Appropriate options for sewerage and sanitation systems in urban areas of Vietnam: overview and research	4	4
Natural resource degradation, lack of infrastructure and social practices in slum areas: reducing environmental risks and proposing technical improvements according to the aspirations and economic capacities of the population	4	4
Dependency relations and movement of people, goods, and capital between intermediate cities and metropolitan centres in Mekong countries: reducing disparities and unequal dynamics, and promoting integrated urban policies	3	4
Improvement of living conditions for low-income people in urban areas of the Mekong Region	4	4
Conservation of historically and culturally valuable areas and buildings	2	4
Housing market dynamics, land tenure systems and slum area development: reducing speculation and exclusion of the urban poor	4	4
Establishing a systematic education and training programme for urban environmental management in the Mekong Region	4	4
Capacity building for city/town government: urban governance and management	1	4
Reducing the development gap between large and small cities and towns in the Mekong Region	2	4
Impact of economically driven development on young people's behaviour and educational patterns	2	4
Improvement of urban environmental sanitation to promote sustainable development through re-use and recycling of organic waste for urban agriculture	5	4
Upgrading housing conditions in inner-city areas – the case of HCMC	3	4
Agricultural re-use of organic waste in urban areas of the Mekong Region	5	4
Urban and rural linkages	1	4
Urbanisation in the Mekong Region under the pressure of globalisation	2	4
Reducing disparities between inner-city and the peri-urban areas in the Mekong Region	2	4
Selection of appropriate composting technology to produce fertiliser from organic waste in urban areas	4	4
Upgrading water supply systems in new areas of urban expansion	4	4
The effect of rapidly growing cities on urban environments and livelihood	4	4

Table 6

Title	Realm	Priority	Proposed research themes: highland and highland-lowland contexts.
Living with flooding	5	1	
Poverty reduction for highland communities: income generation and living conditions	2	1	
Laws and policies related to highland community issues	1	1	
Potential of shifting cultivation: ways and means of modifying/improving upland farming to support livelihoods	3	1	
Mechanisms of compensation for the use of mountain resources by downstream areas	3	2	
Linkage between resource allocation, taxation and pricing systems; resource status and utilisation in highland and lowland areas	1	2	
Measures for mitigating deforestation	5	2	
Gender issues in land use, non-timber forest product management, and community forestry among ethnic minorities (Muong)	4	2	
Capacity building in highland communities	3	2	
Improving highland livelihoods: strengthening the non-farm sector in mountain areas	3	2	
The role of ethnic groups in the use and management of natural resources in highland areas	2	2	
Strengthening local organisations in highland areas	1	2	
Ensuring stakeholder participation in sustainable development in Mekong countries	2	2	
Strengthening local administration and organisational capacity for managing natural resources and the environment through auto-didactic learning processes	1	2	
Community capacity for implementing community-based forest fire management	5	3	
Selecting solutions for environmental protection in handicraft villages in the Mekong Region	4	3	
Government attitudes and policies towards ethnic minorities in the Mekong Region: highland-lowland interaction	1	3	
Upland land use dynamics: indigenous knowledge, bio-physical and socio-economic constraints and potentials	4	3	
People's participation in decision-making processes in small-scale integrated watershed management	4	3	
Impacts of land allocation on land use and land tenure by ethnic minorities (Dao and Muong)	1	3	
Resource accounting and GIS exercise at the community/sub-watershed level – an effective means for monitoring resource status and utilisation	1	4	
Natural resource accounting at the level of river catchment/district – a framework for resource allocation and institutional analysis	5	4	
Cost-benefit analysis of the natural conversion of communal degraded highland forests into sustainable domestic productive forests	2	4	
Soil conservation in highland areas	5	4	

(continued p. 288)



Table 6  
(continued)

Title	Realm	Priority
Traditional regulatory systems for natural resource management among ethnic minorities (Tay, Nung, Ede and Muong)	2	4
Globalisation and local wisdom: interactive processes in the Mekong Region	1	4
Upland farming systems	3	4

## 9.5.2 Discussion of compiled and prioritised research themes

A total of 61 themes were proposed. As shown in Table 7, they are fairly well distributed among the five “scientific realms”. The most heavily represented realms are political/institutional and infrastructure/land use.

Table 7

Overview  
of the proposed  
research themes  
by scientific realm.

Realm	Urban/ peri-urban	Highland – lowland	Total
1. Political and institutional	7	8	15
2. Socio-cultural and economic	6	5	11
3. Population and livelihood	3	5	8
4. Infrastructure and land use	15	4	19
5. Bio-physical and ecological	3	5	8
Total	34	27	61

The number of themes assigned to each priority rating in the two context groups is shown in Table 8. It is noteworthy that the peri-urban/urban group was very sparing with prioritisation, giving first priority to only two proposals and assigning most themes a priority of 4. By contrast, the highland/lowland group gave twice as many themes a first priority rating, with the largest number of themes receiving a rating of 2.

Table 8

Overview of the  
proposed research  
themes by priority  
rating.

Context	Priority rating						Total
	1	2	3	4	5	6	
Urban/peri-urban	2	4	6	22	–	–	34
Highland/lowland	4	10	6	7	–	–	27
Total	6	14	12	29	–	–	61

This difference may be partly explained by procedural differences. The “B” group first rated the themes according to “importance” and then rated their “urgency” in a second round. The “A” group attempted to assign ratings of 1–6 in one go. This may have discouraged the rating of 2, for example, because participants who did not want to designate a theme as “less urgent” (e.g. 2), were inclined to give it a rating of 3 (“important and urgent”) instead. This does not explain the surprisingly high number of 4 (“important but not urgent”) ratings assigned by the urban group, however. At any rate, it was found to be difficult to use two criteria combined into one scale.

Participants found that the time available to assess the themes was much too short. Furthermore, it was difficult to assess themes on the basis of title alone, without considering content and approach. Some participants felt that it would have been useful to explicitly consider the extent to which proposals corresponded to the core problems identified.

Participants also noted that the proposals did not yet address the specific patterns of related problems that form a syndrome. The response to this was that brainstorming on themes was only a preliminary step; it is not yet a test of the syndrome hypothesis.

### **9.5.3 Research to be pursued by the NCCR North-South in the JACS South East Asia**

Based on the outcome of the Hanoi workshop, the specific knowledge and expertise of the partners involved and the limited resources available, research actively pursued in the JACS South East Asia will focus on (a) how to mitigate problems related to poor environmental sanitation in urban and peri-urban areas, and (b) developing mitigation strategies in conflicts between slash-and-burn farmers in the hills and rice farmers in the valleys. Research related to (a) will consider new strategies for the planning and implementation of environmental sanitation services, based on an integrated approach and the Bellagio Principles for sustainable environmental sanitation (Schertenleib et al., 2003). Research related to (b) will consider the spatial distribution of forms and levels of poverty in the uplands, systems of land conservation and the political decision-making process for conservation of forests.

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# 10 JACS Central America and the Caribbean

## Key Challenges of Sustainable Development and Research Priorities: Social Practices as Driving Forces of Change

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Fig. 1  
The urban environment: a reality for 75% of the population in Central America and the Caribbean. New social and economic solutions are needed to solve global issues (shown here: Mexico City).  
Photo: Jean-Claude Bolay

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\* On behalf of all the participants of the International Workshop in Havana, Cuba, in July 2001 (listed in Annex 1, p. 454)

## **Abstract**

The Central American and Caribbean (ACC) region consists of 25 countries with 240 million inhabitants altogether and a total GDP of approximately USD 700,000 million. Seventy-five percent of the population in the ACC region live in urban areas. Four main issues emerged in the analysis of core problems of the urban and peri-urban syndrome context: unequal access to housing and essential services such as water; increasing informalisation of the economy; growing migration; and the increase in violence and poverty. With regard to the highland-lowland syndrome context, core problems include scarcity and contamination of water resources, degradation of forest ecosystems and lack of adequate institutional mechanisms to solve environmental problems. In 2001, LaSUR, in collaboration with 7 research partner institutions in the South, launched 3 research projects on social practices as driving forces of change in Mexico, El Salvador, Venezuela, Haiti and the Dominican Republic.

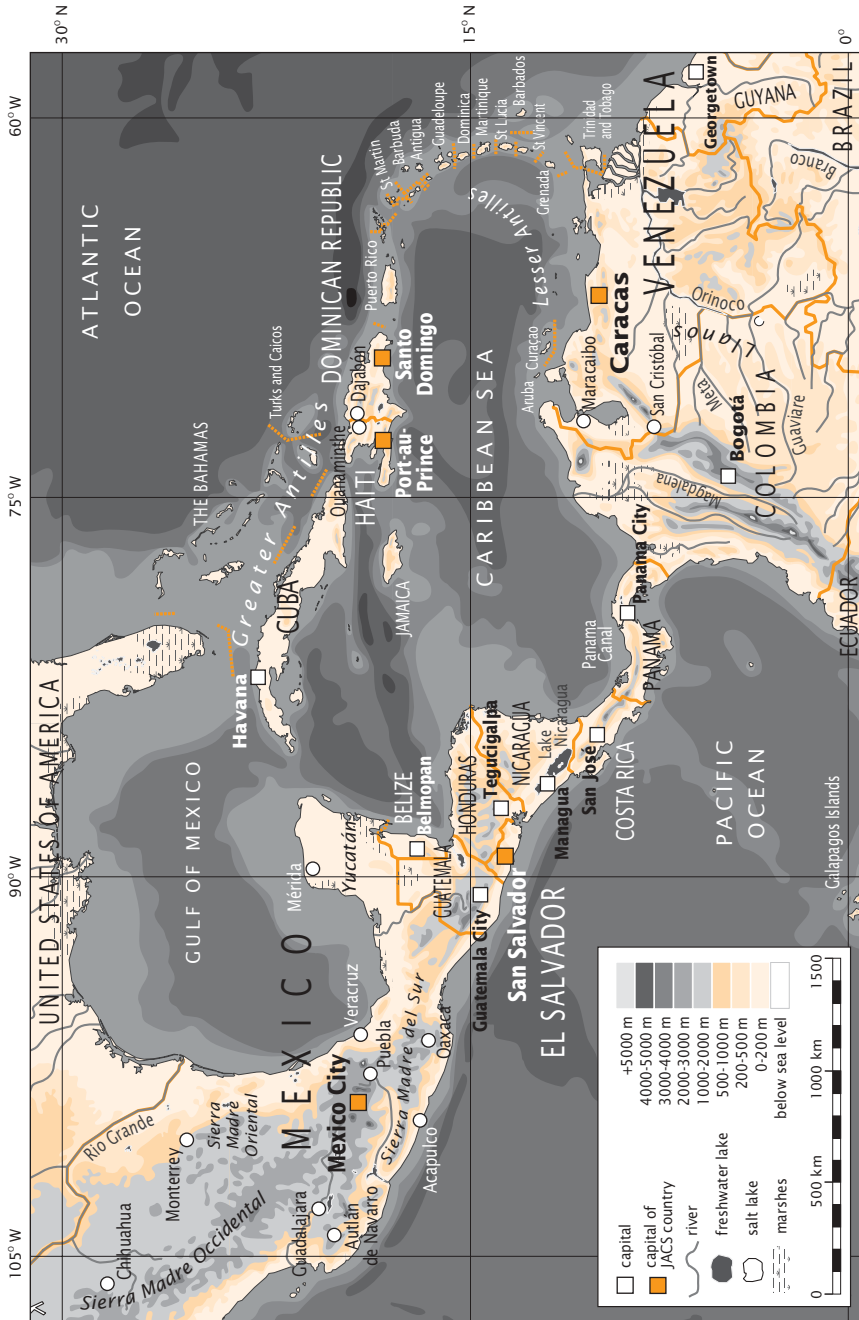


Fig. 2: Currently, the laboratory for urban sociology (LaSUR) of the Swiss Federal Institute of Technology in Lausanne is leading three research projects in the JACS Central America and the Caribbean. They are located in El Salvador and Venezuela (urban violence and security in the context of globalisation), in Mexico (environmental risks, development and urbanisation), and on the border between Haiti and the Dominican Republic (social practices in transforming the urban space).



## 10.1 Introduction to the JACS Central America and the Caribbean

The Central American and Caribbean (ACC) region consists of 25 countries with a total of 240 million inhabitants and an overall GDP of approximately USD 700,000 million (ECLA, 2000). It is an extremely diverse region, both ethnically (with Indians, Whites, Blacks, Creoles, Mulattos, Asians) and linguistically (Spanish, French, Creole, English, indigenous languages), as well as geographically, economically and politically. However, it is possible to distinguish 3 main geographical groups with certain similarities. The first consists of the 3 large mainland countries (Mexico, Colombia and Venezuela), the second is made up of the island nations (Cuba, Haiti, Dominican Republic, Jamaica and the arc of the Lesser Antilles and Guadeloupe, Martinique, Grenada, Trinidad and Tobago), and the third comprises the Central American countries (Guatemala, Belize, Honduras, Nicaragua, El Salvador, Costa Rica and Panama).

An important feature of the Central American and Caribbean region is its immense biodiversity, which is characterised not only by a high number of species, but also by an enormous variety of ecosystems, ranging from coastal marine habitats to high mountains, and from arid habitats to humid tropical forests (BSP et al., 1995). The ACC region is also an area often affected by natural phenomena such as cyclones, hurricanes, floods, earthquakes and droughts. The Central American and Caribbean region is of great geopolitical importance and has been the scene of major social and military struggles throughout the 20<sup>th</sup> century. The development of globalised neo-liberalism may have an extremely negative effect on the region due to its fragmentation, enormous inequalities in the distribution of wealth, and the growing exclusion of specific sectors of the population from economic, social and political life, encouraging continuous emigration to North America (Torres, 2000). The region's role as a frontier zone between North and South also determines the importance of two opposing human flows, with a powerful cultural and economic impact: the ACC region receives tens of millions of tourists annually, while at the same time millions of migrants try to emigrate to the North either legally or illegally. The two resulting sources of income – tourism and family remittances – are crucial to most of the economies in the region. The ACC region is extremely dependent on trade and financial decisions in the United States. While the degree of urbanisation in Mexico, Colombia, Venezuela and Cuba reaches approximately 80% (UN-Habitat, 2003), the rural world is important in the rest of Central America and the Caribbean. The

region also faces severe environmental problems originating from distorted and unbalanced economic growth, social marginalisation, unplanned urbanisation and industrialisation, and a high rate of demographic growth (Carabias et al., 1994; FAO/CCAD/CCAB/-AP, 1999). Environmental degradation also reflects the numerous, complex and often confusing interactions between the rural and urban zones: urban zones have been the focus of economic growth, whereas rural zones have been regarded as the mainstay of food production and cheap labour for the benefit of the urban population (Barkin, 1995).

Table 1

	Year	Dominican Republic	El Salvador	Haiti	Mexico	Venezuela
<b>Geography and social indicators</b>						
Surface (thousand sq. km)	2000	49	21	28	1958	912
Total population (million)	2000	8.4	6.3	8.1	98.9	24.2
Annual population growth rate (%)	1990–2000	1.9	2.1	2.1	1.6	2.1
Urban population (% of total population)	2000	65	47	36	74	87
Annual urban growth rate (%)	1990–1995	3.4	2.7	3.9	2.7	2.9
<b>Development and economic indicators</b>						
GDP per capita, at purchasing power parities (USD)	2000	6033	4497	1467	9023	5794
HDI rank (total 173)	2002	94	104	146	54	69
Human Poverty Index (% of population below poverty line)	1989–2000	20.6	48.3	–	10.1	31.3
Population in agriculture male / female (% of labour force)	1980–1982* 1998–2000	–	37/ 6	81/ 53*	27/ 9	20/ 2*
Public expenditure on education / health (% of total public expenditure)	1995–1997/ 1998	2.3/ 1.9	2.5/ 2.6	–/ 1.4	4.9 /2.6	5.2/ 2.6
Population with access to safe water /adequate sanitation (%)	2000	79/ 71	74/ 83	46/ 28	86/ 73	84/ 74
<b>Environmental indicators</b>						
Crop land per capita (hectares)	1997–1999	0.13	0.09	0.07	0.26	0.11
Area of severe soil degradation (% of country)	2000	41	94	99	45	21
Protected area (% of total surface)	1999	31.5	0.3	0.4	3.5	35.6
Energy consumption per capita (kilogram of oil equivalent)	1999	904	651	265	1543	2253

Some key indicators for the countries in the JACS Central America and the Caribbean.

Sources:  
UNDP, 2002;  
World Bank,  
2002a+b;  
FAO, 2000

## 10.2 Selection and justification of core problems

Based on an initial discussion of the conceptual framework of the NCCR North-South, the idea of “core problems of the region’s development” was used as an entry point to construct a preliminary approach to these problems. The first brainstorming session produced a list of approximately 70 core problems. These were then summarised, categorised by scientific realm and ranked according to perceived priority (Table 2).

Table 2

Problems and core problems, listed by scientific realm and prioritised.	Scientific realms	Initial list of problems	Prioritised list of core problems
	Political & institutional	Political and economic dependency. Unequal distribution of wealth and social resources. Lack and inadequacy of political, administrative and institutional structures. Lack of representativeness of the political system. Corruption. Decapitalisation. Lack of power of civil society. Privatisation and lack of financial resources for the provision of basic services.	1. Concentration of power and lack of representation. 2. Increasing weakening of economic and political power and growing dependence on the USA. 3. Crisis of the traditional institutional mechanisms of urban management 4. Exclusion from access to information, technology, knowledge and cultural production.
	Socio-cultural & economic	Violence and insecurity. Migration. Poverty and increasing economic disparities. Exclusion. Social and spatial fragmentation. Loss of identity and social networks. Religious fundamentalism. Gender imbalance. Outbreak of armed conflicts. Unemployment and underemployment.	1. Exclusion, fragmentation and new urban poverty. 2. Increasing job insecurity and informalisation of the economy. 3. Violence and lack of public security. 4. International migration.
	Infrastructure & services (in urban contexts)	Rapid urbanisation (inadequate growth leads to deficiencies in basic services). Inadequate access to urban land. Lack of adequate housing. Water (access, quality, quantity). Lack of essential services (e.g. health, education). Contamination (air, water, soil). Absence of waste management. Ignored importance of the informal and illegal sectors.	1. Access to city and essential services. 2. Access to urban land, housing and water as essential resources.

Table 2  
(continued)

Scientific realms	Initial list of problems	Prioritised list of core problems
Bio-physical & ecological (in rural contexts)	Environmental degradation. Inadequate management of socio-environmental risks. Threat of desertification. Loss of biological diversity. Overuse of natural resources. Negative socio-environmental impact of accelerating development of tourism. Absence of environmental education policies. Conflicting interests of different stakeholders and natural resource use practices. Lack of policies and payment mechanisms for the use of natural resources. Inadequate access to land. Inadequate access to water. Lack of essential services (e.g. infrastructure, health, education). Contamination, pollution. Expansion of cattle ranching. Lack of farmer organisations.	1. Depletion and pollution of rivers and other sources of water. 2. Degradation of forest ecosystems. 3. Inadequate institutional mechanisms to solve environmental problems.

## 10.3 Status and dynamics of core problems

This section features a short description of every core problem. Core problems are grouped by scientific realm and listed in decreasing order of priority.

### 10.3.1 Political and institutional realm

#### *Concentration of power and lack of representation*

The governance of democracies is becoming a central issue on the agenda of conservative thought: how does one reconcile the economic results of the neo-liberal model and the growing inequality generated with existing democratic institutions? A progressive impoverishment of the notion of democracy can be observed as the population is separated from the exercise of its sovereignty over key decisions. Major decisions concerning economics, national security, media control etc. are increasingly taken out of the hands of parliaments (Harnecker, 1999); hence there are growing abstention rates, a proliferation of social movements (involving women, indigenous people, youth, religious groups and environmental organisations), a loss of prestige associated with the political class, and a weakening of trade unions. This has led to a profound crisis of representation in the political system, which, however, has been offset by an aggressive process of power concentration in the hands of the executive branch and of certain powerful national and international economic groups.

#### *Increasing weakening of economic and political power and growing dependence on the USA*

The weakness of state political power and regulatory capacity are expressed, for example, in the widespread tendency towards privatisation and tax reforms for the benefit of minorities, both of which, in turn, further deprive the state of public resources. At the same time, galloping decapitalisation as a result of debt payment, capital flight and the dramatic ups and downs of international speculative capital (known as “swallow capital”) tends to leave states exhausted and without the necessary resources to undertake national economic and social development. They depend on the USA with regard to economics, politics, culture, technology, energy, finance and ideology. There is an urgent need for these states to review and reconstruct obsolete fiscal, credit, planning and budget, legal and administrative tools, which may be of interest to national oligarchies but are absolutely ineffective for the large majority of the population and in the given local realities.

*Crisis of the traditional institutional mechanisms of urban management*

Informality has invaded various aspects of urban reality, such as land occupation, housing construction, job creation, and service and infrastructure provision. The institutional reaction has usually been to leave growing sectors of city life outside the law. New strategic plans seek to achieve agreement between extremely unequal actors who are often absent from the negotiations, on preventing and controlling urban transformations. However, both local policies and the effects of globalisation, which tend to dissociate decision-makers from those actually affected by the decisions, have produced an increasingly unmanageable situation.



Fig. 3  
Conventional instruments for urban planning, such as rational zoning or traditional urban regulations, are notoriously inefficient (shown here: Caracas, Venezuela). Photo: Yves Pedrazzini

*Exclusion from access to information, technology, knowledge and cultural production*

Large sectors of the population are not only excluded from material resources, but also, and even more so, from intellectual resources. The gap between the amount of information available to the 500 million inhabitants worldwide connected to the Internet and that available to the 5,500 million who are not has never been so wide. The barrier is no longer only literacy, but also accessibility, as access to information is becoming increasingly distant and manipulated. In this respect, increasing media concentration attempts to create a growing homogenisation of taste, attitudes and a “single way of thinking” in order to “fabricate consensus”, thereby producing an ever wider gap between producers and consumers of culture and information. As a result, “the media in the electronic era at the service of human isolation are imposing the unanimous adoption of the values of neo-liberal society” (Galeano, 1998).

Table 3

Access to  
information.

Source:

<sup>1)</sup> www.geogra-  
phyIQ.com,  
accessed April  
2003, and <sup>2)</sup>  
UNCHS, 2001

Country	Internet users <sup>1)</sup> (% of total population) 2000	Television sets <sup>2)</sup> (per 1000 people) 1995
Mexico	2.48	261
Dominican Republic	0.29	86
Haiti	0.09	5
El Salvador	0.67	230
Venezuela	1.67	131
Switzerland	33.33	459

**10.3.2 Socio-economic and cultural realm**

*Exclusion, fragmentation and new urban poverty*

Social segregation and the presence of a “highly differentiated, segmented urban social structure” (IIED-AL, 1989) are the simplest way of explaining poverty in Latin American cities. The emergence of poverty belts that absorb the avalanches of migrants flowing to the cities since the mid-20<sup>th</sup> century and the subsequent conversion into slums of the historic centres of most capital cities in the region are among the main concerns of local and central governments. Recent figures released by the Economic Commission for Latin America and the Caribbean (ECLA, 2000) show that although poverty was reduced in most Latin American countries from 41% in 1990 to 36% in 1997, the number of poor and extremely poor has remained steady at approximately 90 million. Overall, urban poverty in the region reaches 62%, and

rural poverty is even higher. Indeed, by 1997, 54 % of the rural population were living in poverty (half of them in extreme poverty), as opposed to 30 % in urban areas (a third of whom are living in extreme poverty).

*Increasing job insecurity and informalisation of the economy*

The loss of importance of the formal economy in the ACC region has exacerbated unemployment and underemployment and led to an increase in the use of individual and family survival strategies. According to data from ECLA, the unemployment rate in 1998 was at 8.4 %, the most severely affected groups being women, young people and low-income households. The highest number of jobs in Latin America is generated by the informal economy, with 84 out of 100 jobs being created in the informal sector or in small businesses (ECLA, 1998). “In this new era of globalisation and information technology, work has been transformed into a source of social insecurity, rather than social security. It is no longer feasible to use the expression of more work to stabilise society [...]” (Wacquant, 2001).

*Violence and lack of public security*

Violence and lack of public security are becoming increasingly acute and widespread in Latin America. Since 1980, homicide rates have increased by a factor of 3 or 4 in almost every country of this region. The high homicide group includes El Salvador, Guatemala and Colombia, followed by Mexico, Venezuela, Brazil and Peru (Briceño-León and Zubillaga, 2002). As a result of the processes of social polarisation and fragmentation, the region has become the setting for numerous forms of violence (political, social, economic, intra-familial and criminal) within a context of progressive loss on the part of the nation states of the ability to guarantee public order. Indeed, the increase in violence has been accompanied by the privatisation of safety and widespread corruption, particularly among police staff and government administrations. At the same time, an ideology is propagated that stigmatises poverty and cites the poor as being responsible for the lack of public security. This creates a vicious circle of exclusion and marginalisation, provoking a feeling of devaluation in people which, in turn, leads to isolation between them, to the weakening of neighbourhood ties and to the loss of identity and social networks (Sánchez and Pedrazzini, 1993).

*International migration*

Migration from Caribbean and Latin American countries to the United States and Europe is steadily increasing. Sending countries lose part of their workforce and some of their best-educated and most enterprising people as



rich countries compete for skilled immigrants. However, migration is not only a core problem but also a core potential: sending countries benefit from remittances, and receiving countries can more easily maintain their working-age population. Much of the money sent back to Central America by migrants has helped to rebuild countries after civil war or natural disasters. Migrant remittances to Mexico in 1996 amounted to USD 4,224 million or 14 times the total sum of net foreign aid received. Remittances to the Dominican Republic amounted to USD 914 million or 9 times the total sum of net foreign aid received (Anonymous, 2002).

### **10.3.3 Infrastructure and services in urban contexts**

#### *Access to city and essential services*

A long history of exclusion has produced cities that are physically, socially, economically and legally divided into two cities: one formal, the other informal. Urban services such as safe drinking water, liquid and solid waste disposal, electricity and communications belong to the “citizens’ rights” (Pírez, 2000). In practice, however, the lower a person’s economic capacity, the less access he or she has to services. Although the right to urban services is considered in the rules of urbanisation, these rules are not applied in social land and housing programmes, which oblige users to pay for services from their own resources. In consequence, a high percentage of the population lacks access to safe water and sanitation services (Table 4).

#### *Access to urban land, housing and water as essential resources*

At present, millions of housing units would have to be built annually to prevent a further increase of the accumulated deficit and restore dilapidated, crowded buildings, many of which were built informally and without technical assistance, while others were built based on unsuitable models for the population’s needs (ECLA, 1997). Instead of offering an encouraging outlook, housing policies in the Central American and Caribbean region show a continuous downward trend, as official budgets have been reduced ever since the financial crisis of the 1980s. Official attitudes towards the overwhelming reality of these self-built working-class districts have been characterised by ignorance and neglect, not to mention sanctions, prohibition and attempts or threats to eradicate them.

Table 4

Country	Population with access to safe water (%)			Population with access to sanitation (%)		
	Rural 1997	Urban 1997	Total 1997	Rural 1997	Urban 1997	Total 1997
Mexico	n.a.	n.a.	85	n.a.	n.a.	72
Dominican Republic	n.a.	80	65	83	76	78
Haiti	28	50	37	17	49	25
El Salvador	40	84	66	80	98	90
Venezuela	75	80	79	30	64	58

Access to safe water and sanitation.

Source: WRI, 2000

### 10.3.4 Environment in rural contexts

#### *Depletion and pollution of rivers and other sources of water*

In the Central American and Caribbean region, as in many other parts of the world, water supply will be one of the greatest challenges to meet over the next few years (IUCN, 2000). Agricultural and industrial activities, which constitute major economic engines of the Central American and Caribbean region, also tend to be the most polluting. Moreover, water pollution usually affects the poorest sectors of society, which, in most cases, do not obtain economic benefits from the productive activity that causes the pollution (Boelens and Dávila, 1998; INE, 2000).

#### *Degradation of forest ecosystems*

One of the most striking environmental features of the Central American and Caribbean region are its large forested areas, concentrated mainly in mountainous areas. Nowadays, however, the region's forest resources are experiencing a gradual degradation that affects the environmental products and services the forests provide to both urban and rural populations (WRI, 2000). Like other environmental problems in the region, the decline of the forest resource also has its origin in multiple factors: in the case of Mexico, for example, it is due to the combination of forest fires, clear-felling for livestock and agriculture, illegal commercial logging, irrational exploitation of non-timber forest products, expansion of urban settlements onto productive land and the impact of infrastructure such as roads, highways and power

lines. The presence of these factors constitutes a general pattern in the region, and one with growing consequences (Harcourt and Sayer, 1996; INE, 2000; IUCN, 1992).

Table 5

Country	Original forest as percentage of land area (approx. 8000 years ago)	Current forest as percentage of original forest cover (1996)
Mexico	55	63
Dominican Republic	98	25
Haiti	93	1
El Salvador	99	10
Venezuela	75	83
Switzerland	85	44

Forest cover.

Source: WRI, 2000

*Inadequate institutional mechanisms to solve environmental problems*

Awareness of environmental aspects of urban and territorial development has gradually been incorporated into the public policies of Latin America and the Caribbean. Despite this, in several countries throughout the region environmental sustainability continues to be relegated to the background in decision-making. Sectoral policies and instruments tend to be based on a type of regulation that is more reactive than preventive. From an institutional perspective, the region is characterised by a multitude of government offices, each with its own specific mission and programme. There is a predominance of sectoral approaches with weak inter-institutional linkages. In most cases, environmental issues are absent from the design of social intervention programmes or have only recently been incorporated, which has so far reduced their impact on problem-solving. Moreover, in most cases there is a clear separation between environmental and economic aspects. Although several legal reforms have been implemented in recent years, they have primarily been aimed at ensuring national economic growth, while omitting the environmental component, the rural population and most of the urban population (Gutiérrez, 2001; Simonian, 1999; Wehrmeyer and Mulugetta, 1999).

## **10.4 Synopsis and syndromes**

### **10.4.1 Urban syndrome context**

The last decade saw the phenomenon of greater development of peri-urban and urban zones. This meant the integration of new areas into urban development and the reproduction of some of the problems that characterise large cities such as increased poverty, an increase in the value of land and housing, lack of access to services and infrastructure, environmental deterioration and, above all, a decline in the quality of life. Furthermore, the restrictive policies and theoretical schemes of institutional planning used in attempts to direct the production of urban areas, as well as the speculation that governs the property market, have exacerbated social inequalities and environmental degradation. As a result, “illegal” or “informal” settlements have emerged over the past 20 years, housing an estimated 50 % of the city population. In most cases these settlements were built on land that is not fit for housing, as this is the only type of land that the economically weak population can afford. Access to urban land with basic services is increasingly becoming an additional factor of exclusion of the low-income population and leads to growing impoverishment of the urban spaces inhabited by the poor.

### **10.4.2 Highland-lowland syndrome context**

The highlands in the ACC region are to a large extent inhabited by impoverished rural populations, particularly indigenous groups (Toledo, 2000). The highlands, while being rich in natural resources, generally show high levels of poverty and migration, as well as a common lack of infrastructure and employment opportunities. People in the highlands increasingly leave their mountain regions and move towards the more urbanised lowlands in search of a better livelihood (this is illustrated, for example, by the annual growth rates of urban populations in the ACC region given in Table 6). The most important highland-lowland interactions include water production in the rural highlands for urban centres and industries in the lowlands, and a human highland-lowland (rural-urban) migration flow in the Dominican Republic, Haiti, El Salvador, Venezuela (except Caracas) and Mexico (except Mexico City).

Table 6

Process of  
urbanisation.

Country	Level of urbanisation (%) 2000	Urban population (million) 2000	Annual growth rate (%) 2000–2015	Rural population (million) 2000	Annual growth rate (%) 2000–2015
Mexico	74	73.5	1.6	25	0.3
Dominican Republic	65	5.5	2.0	2.9	-0.4
Haiti	35	2.9	3.2	5.2	0.5
El Salvador	46	2.9	2.5	3.3	0.7
Venezuela	87	21	1.9	3.1	-0.1
Switzerland	67	5	0.5	2.3	-0.5
World	47	2845	2.0	3210	0.3

Source:  
UNCHS, 2001

### 10.4.3 Key concepts of the NCCR North-South

In this section, some elements of the NCCR North-South conceptual framework are discussed, particularly the concepts of globalisation, global change, syndrome and sustainable development.

The idea of “syndromes of global change” is based on certain assumptions:

- a) A process (or rather trend) of transformations of a global scope, with guiding impulses and dynamics that transcend national borders, is currently underway in every sphere of natural and social life (economics, ecology, culture, politics).
- b) The effects or impacts of “global change” are expressed differently in different specific regions of the world; they occur in sets of common problems that are sometimes due to the same causal structure.
- c) Some of these changes are either not oriented towards, or specifically oppose the harmonious development of societies and the preservation of nature; they jeopardise “sustainable development”.

These assumptions deserve to be dealt with in more detail. Indeed, the diversity of approaches to the concepts of syndrome, globalisation and global change, and the course these approaches have taken, warrant clarification – not to mention the polemics on sustainable development.

*Globalisation and global change*

Globalisation is a polysemous term. Nowadays everything, or nearly everything, falls under the broad mantle of globalisation: the growing uncontrolled international flow of capital, continuous advances in information, communication and transport technologies, the shrinking power of nation states, genetic engineering, global warming, the strengthening of multinational firms, international mobility of labour, expansion of the informal sector and the Americanisation of culture. “The ambiguity in the use of the term hampers attempts to distinguish cause from effect when one analyses what is being done, why it is being done, who is doing it, who they are doing it to and its consequences, (...) converting it into a force, a fetish with an independent existence, that is remote from the will of human beings, irresistible and inexorable” (Marcuse, 2000). In the current analysis of problems related to the omnipresent process of globalisation, it is crucial to examine both upstream (what globalisation comprises) and downstream (how it affects various spheres of social life) in order to distinguish between social processes that have been intentionally confused to suit particular interests.

In any case – beyond the academic, ethical and political discussions of globalisation, and without wishing to overlook any other meanings of globalisation – three of the main aspects of the term are given below:

- a) The economic process by which new forms of accumulation are created on the basis of information technology; free flow of capital, goods and persons; expansion of the presence of transnational firms; and an increase in intensity, volume and circulation of financial flows.
- b) The political process that reinforces the supranational mechanisms regulating this economy. This process usually includes a transition phase in which nation states lose their scope for decision-making. Historically, this process has entailed the establishment of a unipolar system of government by the military.
- c) The discursive and practical construction of a set of “global problems” by supranational organisations and cooperation agencies in the countries of the North. The idea is that nowadays environmental changes, migration, worldwide epidemics and absolute poverty are problems that can only be solved by global efforts on a far greater scale than before.

Whatever the primary understanding of globalisation, this set of transformations is obviously interrelated. One can even venture to say that its interrelations are not only a question of the simultaneity of processes in time and space, but also of an era of mankind, in which the intensity of the mechanisms for accumulating and extending capital are closely linked to the deterioration of national and local political systems of regulation and the over-exploitation of natural resources. This means that possibilities of mitigating the impact of global change are linked, in one way or another, to the institutions and mechanisms that regulate societies economically, socially and politically.

At the same time, however, territories and societies have specific mechanisms for metabolising the impact of globalisation. It is true that at other times the history of mankind was primarily the history of various local societies, whereas nowadays it increasingly merges into a single history full of interrelations. Nevertheless, it is impossible to eliminate the heritage and specificity of each society with one stroke of the pen. The various cultural and civilising matrices, the ways of constructing public power, the degrees of social inclusion or exclusion etc. are some of the variables that establish the conditions and varying degrees of opportunity determining how each society must cope with globalisation.

This reasoning forces us to examine at least two aspects, one of a theoretical, the other of a praxeological nature. Regarding the former, globalisation and global changes must be understood as the result of interactions between global impulses and the historical, natural and cultural specificities of a particular society. Neither economic regulation nor the exacerbation of environmental conflicts take place in a vacuum: they are specifically produced in historically constituted societies, which brings us to the second point. Expressed in a simple way, mitigation, reversal or suppression of the “negative” aspects of globalisation involves a set of actors that operate at both levels: in the centres of global decision-making, as well as in the matrix of local, regional or national actors. From this perspective, it is essential to understand globalisation as the result of specific social relations, including, obviously, structures of power.

#### *Sustainable development*

There is still one aspect to be dealt with before we return to the potentialities and limits of using the syndrome concept: basically, it is the question of what normative and evaluative framework is being used to classify the effects of

globalisation as good or bad, sustainable or non-sustainable, inclusive or exclusive, degrading or conserving. This also involves the question of who establishes these norms and converts them into “social legality”. This short text does obviously not attempt to respond to these concerns; it shall merely point out that it is essential to be aware of the fact that the idea of sustainable development is underpinned by a proposal with powerful normative connotations that must be made explicit, constructed and reconstructed continuously. The broad and intense debate that followed the publication of the Brundtland Commission Report in 1987 has successfully debunked the idea that the concept of sustainable development is neutral or, worse still, unique. On the contrary, the concept of sustainable development has spawned trends ranging from environmental neo-liberalism to new approaches to political ecology and even doctrines such as liberation ecology.

#### *Contexts and syndromes*

In addition to the arguments outlined above, a brief summary of some of the potentialities and limits of using the concept of syndrome and syndrome contexts within the conceptual framework of the NCCR is given in Fig. 4.

At present there is no overall theory capable of successfully explaining the contemporary phenomenon of globalisation and the explosion of its effects and impacts on the world’s societies and territories. The concept of syndrome and syndrome contexts may be useful for constructing an intermediate theory linking two dimensions that refer to the object of knowledge and two dimensions that refer to the construction of science itself.

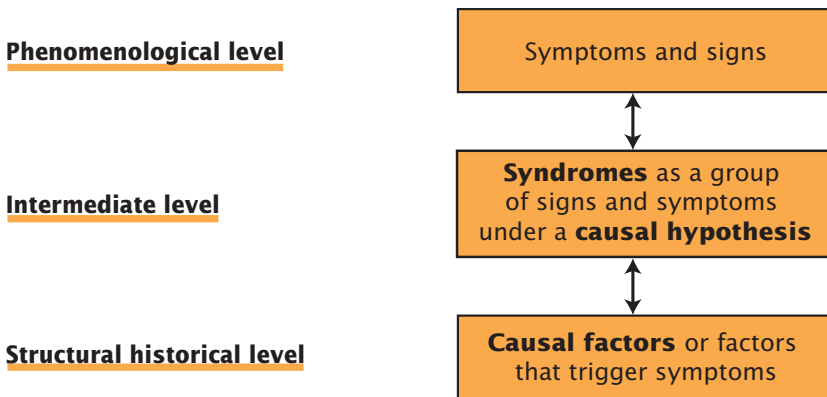


Fig. 4  
The syndrome  
concept and  
levels of analysis  
of reality.



Regarding the object of knowledge, the syndrome concept can approach the link between phenomenological expressions and structural processes, of which symptoms and signs are expressions.

Within an increasingly globalised contemporary history, the syndrome concept can link various territorial scales. “Global change” has generally been regarded as a radically new trend of transformations at the global level that are organised by supralocal impulses. The emphasis on supranational and supralocal levels reduces the possibilities of human action (both transformative or mitigating) that occurs in specific territories, societies and times. However, the various forms of metabolisation of globalisation-related trends in each historical society provide arguments for identifying fairly specific expressions of global change in each region (metropolisation, desertification, cultural and environmental conflicts); this knowledge could then serve to restore the potential of historical societies for coping, preventing, mitigating, transforming. This could be a highly positive aspect of the syndrome concept.

With regard to the construction of knowledge, the syndrome concept:

- a) offers the possibility of a multi- and transdisciplinary approach that involves dealing simultaneously with entire sets of problems, as opposed to disciplinary approaches that deal with problems individually within various and often unconnected scientific fields. The link between social and natural sciences and the pre-eminence of holistic and integral approaches is particularly important;
- b) offers a possible route, probably either transitory or incomplete – as it was used in the history of medical thought – at a historical moment in which, as pointed out earlier, there are no existing paradigms for the overall explanation of phenomena of an unprecedented nature and scope.

At the same time, however, certain limitations and dangers must be considered:

- a) In the first place, the term “syndrome” tends to be associated with images of pathology, disorder, imbalance and anomaly. This approach would require beginning with a definition of what is regarded as health, equilibrium, order and standards in the social field.

- b) Using a pathological approach to deal with reality might lead to placing more emphasis on the identification of problems rather than of resources, potentialities, movements and creative social practices. The aim is not only to mitigate the symptoms of global change but also to identify and strengthen potential solutions.
- c) The syndrome concept is not easily integrated with historical or process-based views. A syndrome groups together symptoms at a given moment and in a given place. It implies simultaneity, recurrence, proximity and the functional continuity of phenomena, yet rarely shows the evolution of processes and tendencies in larger historical cycles.
- d) If we assume the non-existence of a single normative framework based on the qualities of truth, neutrality and objectivity, the use of the syndrome approach requires either an explanation of the normative framework (subjects, interests, discourses) that serves as a basis for the classification of what is desirable or undesirable, or the joint deliberative construction of this framework by all various agents involved.

#### **10.4.4 Synopsis**

The phenomenon known as globalisation and the characteristics and particularities of the Central American and Caribbean region are two causal elements of equal importance. The interrelationship between these two elements determines the way in which other factors, such as the use of natural resources, politics, economy and social factors are expressed. Four main issues emerged in the analysis of core problems of the urban and peri-urban syndrome context: unequal access to urban land, housing and essential services such as water; increasing informalisation of the economy; growing international migration; and the increase in violence and lack of security.

With regard to the highland-lowland syndrome context it was agreed that the most urgent core problems are scarcity and contamination of water resources; degradation of forest ecosystems and widespread poverty in the highlands; and the lack of adequate institutional mechanisms to solve environmental conflicts such as those that exist between upstream and downstream water users. Water pollution at the national level – often combined with local water shortages – are key environmental concerns of every country in Central America and the Caribbean.

In conclusion, the ACC region is characterised by socially exclusive access to resources, employment and services (e.g. land, water, housing, infrastructure), along with high levels of inequity and poverty, non-sustainable use of natural resources and a growing crisis in the current systems of governance (both at the local and at the national scale).

However, characterising a syndrome on the basis of its geographical and spatial context may encourage geographical determinism and exhaust the explanatory potential of the syndrome category. Although all urban and peri-urban contexts in Latin America may contain sets of similar problems, this does not eliminate the need to specifically explain other dimensions present in the configuration of these problems. Phenomena such as migration, violence and lack of public security, or, in a positive sense, participatory local management, a culture of paying taxes and the construction of urban identities, have reasons and explanations of various orders that cannot be reduced to an “explanatory model” on a geographical and contextual basis.

## 10.5 Research status and focus

### 10.5.1 Potential research themes

During the JACS workshop in Cuba participants proposed around 50 research fields or themes. These themes were then grouped according to syndrome context, one group focusing on the urban and peri-urban, the other on the highland-lowland syndrome context (urban-rural interactions). They are listed below; research themes have not been prioritised.

#### *Urban and peri-urban syndrome context*

- Local economy and urban informality: Research will focus on urban informal economy in the context of globalisation and state restructuring. The precariousness of the informal sector and its confrontation with formal enterprises and public authorities will be investigated. Based on this analysis, negotiation procedures between urban stakeholders will be established in order to promote a socially and environmentally viable economy.
- Metropolisation, violence and safety in developing countries: Delinquent forms of behaviour in marginal social groups and the answers proposed both by the authorities and by the population will be investigated. The study will lead to the definition of, and experiments with, concerted strategies involving different social groups and local authorities.
- Violence and poverty: Development of a research programme that will allow to differentiate violence linked to structural poverty – which occurs among a majority of the urban population sectors in Latin American cities.
- Urban risks: Integration of risk management in urban development in order to develop alternative habitat planning and management models.
- The potential to stabilise and rehabilitate precarious habitat and integrate it into the existing urban structure.
- Identification of new forms of democracy in local management: Decentralisation, ‘new institutions’, participative management systems, formulation of planning systems and land use management.

- The impact of emigration on urban and rural territorial development.
- The impact of the establishment of trans-national enterprises in intermediate cities.
- Investigation of the link between weakening social networks on the one hand, and the new dividing lines between public and private life on the other hand.
- Housing policy and the production of housing in Mexico: The role of the public and private sectors. The main objective of the investigation is to identify the roles of, and the changing interrelations between, the different actors involved in the process of producing social housing in Mexico.
- Polarisation of society and its expression in the urban environment; the gap between high technologies and the culture of social urgency; new urban poverty. Investigation of increasing inequalities with regard to technological policies and access to electronic and virtual mediums of communication and market information.
- Habitat and social development: Generation of proposals for action with regard to urban interventions in public and private spaces by governmental programmes in the social sector.
- Analysis of the impacts of neo-liberal globalisation in the urban environment. Possibilities of developing concerted strategies of action for habitat development.
- The environmental challenges of metropolisation: The need for a regional approach.
- Intermediate cities and regional development: Research will focus on access to land and habitat in intermediate cities, which is one of the main sources of conflicts between administrations, the private sector and inhabitants. Urban integration of migrants, the territorial consequences of these movements, institutional responses and the impact of all these changes on urban and regional planning will be investigated. Finally, the study should lead to the establishment of participatory planning models.

- Socio-economic impact of immigrants: Research will focus on social integration of new citizens, urban-rural interactions, and the significance of formal and informal networks that build knowledge and know-how and facilitate social integration. The study will investigate both migration within Central America and the Caribbean and migration from Central America and the Caribbean to the USA.

*Highland-lowland syndrome context and urban-rural interactions*

- A study of how different local and regional stakeholders perceive environmental problems in the Manantlán region in Mexico.
- Conservation and restoration of mountain forest and wetland ecosystems in order to maintain environmental services.
- Processes of social learning and creation of platforms to negotiate sustainable natural resource management: An analysis of social learning processes and of the potentials and limitations of different groups of stakeholders interacting on negotiating platforms.
- Natural resource use and its socio-environmental impact in the region of Manantlán, Mexico.
- Sustainable local development: Interdisciplinary and inter-sectoral research on sustainable and equitable local development processes that may serve as a model for similar regions.
- Investigation of adaptive and integrated natural resource management strategies of farmer and indigenous communities, with the objective to formulate adequate policies to support them in their own efforts.
- A participatory diagnosis of the environmental situation in Central America and the Caribbean (action research): Development of mitigation strategies in a participative manner, linking environmental with socio-economic and political aspects. Strategies will be adapted to the different organisational levels (local, regional, national).
- Investigation of the sustainability of farmers' strategies for the management of natural resources, including rural-urban linkages and migration in search of better livelihoods.

- A study on the potential of communal planning of natural resource management based on ecologically sound principles.
- Collaborative planning and management of protected areas in Central America and the Caribbean: Investigation of options for reducing conflicts of interests over the use of protected areas near urban centres (with regard to aspects such as tourism, non-sustainable use of natural resources to supply urban markets, or freshwater availability and use).
- Managing risks and vulnerabilities through integrated regional land use planning.
- Consolidation of freshwater availability and demand: Development of systems for equitable cost and benefit sharing between stakeholders (e.g. compensation mechanisms between downstream urban communities using water and upstream communities managing watersheds).
- Conservation and hydrological rehabilitation of watersheds in the region of Manantlán, Mexico: Research will focus on rural-urban interactions, reduction of contamination levels in rivers, watershed protection, restoration and rehabilitation of watersheds that are degraded due to forest degradation. The goal is to restore the protective functions of watersheds for water resources of urban and rural communities.
- Management of and for knowledge: Organising and building human skills for the participative management of sustainable development. Transdisciplinary research will focus on how to constitute a knowledge network that brings different scientific communities together to ‘learn without limits’ about knowledge management for local development.
- Development of approaches to integrate community and regional programmes into federal, state and municipal programmes.
- Citizen participation and new social practices in local management: A comparative study. This investigation will focus on the following questions: What is the socio-political meaning of citizen participation in local management? How do political-institutional practices change? What changes do they provoke in different actors?

- Does migration lead to exclusion, or does exclusion cause migration? A comparison of impacts in rural and urban areas.
- Local social movements that defy negative effects of globalisation, and their importance for sustainable natural resource management: Investigation of emerging social movements in farmer and indigenous communities, with the objective of identifying innovative potentials for sustainable natural resource management.
- Development of sustainable agro-pastoral and forestry production systems (commercial agriculture in valleys, agro-forestry, livestock) near urban zones. Research will address the following questions: Do existing urban-rural linkages and interactions support sustainable socio-economic and ecological development? Can models be developed that are applicable for other areas?

### **10.5.2 Status of mitigation research**

#### *Urban and peri-urban syndrome context*

Urban settlers have implemented a range of new strategies for obtaining access to land. These strategies can be examined from several angles, such as the economic (new mechanisms of access to material and financial resources); the technological (with regard to both production and design); the social (experimentation with and evaluation of new types of social coordination); the organisational (new ways of producing habitat); the environmental (actions for reducing negative impacts and preserving resources, as well as environmental design proposals for improving the quality of life, at both the architectural and the town planning level); and the normative (examination of the gap between building, architectural and town planning regulations on the one hand, and the current situation on the other hand). Several issues are investigated within this field of research. One concerns the role of intermediate cities within national urban systems, particularly because this type of city is expected to grow at an even faster rate than major metropolitan agglomerations. A second one is the restoration of historic centres, which, in some cases, have suffered decades of environmental degradation. Furthermore, research focuses on the tension or complementarity between the formulation of public policies and the social practices of self-construction and appropriation of urban space.



There is a growing disparity between “democratic” institutions and formal politics on the one hand, and the forms of regulation and legitimisation applied at the grass-roots level on the other hand. Although they are denied, ignored and repressed, these alternative forms are continuously reproduced and create alternative solutions and social networks that are virtually “ungovernable” by the current government; nonetheless they should be studied, analysed and evaluated. The reality of poor neighbourhoods and cities needs to be interpreted in new ways to allow for a reformulation of standards and projects that will be able to provide suitable responses for the majority of citizens.

*Highland-lowland syndrome context and urban-rural interactions*

Sustainable development needs to be considered not only from the point of view of the conservation of natural resources, but also from the point of view of their social and economic use. The sustainability of natural resource management depends also on the type of relations established between rural and urban areas. For instance, the specific characteristics of the functioning of a watershed – where the activities of those living upstream have repercussions for those living downstream – call for integrated, inter-institutional approaches that take into account urban-rural interactions. Research must help to develop watershed management strategies capable of dealing with problems including their origin and effects, and of initiating a process of negotiation among the numerous upstream and downstream stakeholder groups.

**10.5.3 Ongoing IP5 research in the JACS Central America and the Caribbean**

Following the JACS workshop in Cuba, IP5 organised a call for research proposals in September 2001. The workshop participants were invited to elaborate detailed research proposals according to the discussions and results of the workshop.

Out of the 13 full proposals submitted, 3 projects were finally chosen. Each proposal was rated according to 12 selection criteria, such as relevance to IP5 fields of investigation, relevance to syndrome mitigation research, gender balance, likelihood that research results will be implemented, realistic time and budget planning, and others. All 3 selected research projects focus on the urban and peri-urban syndrome context; one of them is also located in a highland-lowland syndrome context. Each project examines both social

practices implemented by the population and public policies formulated by the respective levels of government. Together, the 3 research projects address 12 of the 13 core problems identified. The common research framework is defined as “Social practices as driving forces of change, and their relation to urbanisation and globalisation: An inter-disciplinary analysis focusing on the transformation of space”. Collaboration with other IPs in the ACC region focuses on conceptual and methodological development (IP1), hydrological aspects (IP3), and ecology and natural resource management (IP2). Furthermore, IP5 collaborates with IP4 in the JACS West Africa, with IP8 in the JACS South America and with IP3 in the JACS South East Asia.

**Project title:** *Urban violence and security in the context of globalisation: Identification of strategies of public authorities, private industries and the population against urban violence and for social and territorial security.*

*Main partner institutions:* Central American University José Simeón Cañas in El Salvador, Central University of Venezuela, University of Pennsylvania

*Location:* El Salvador (San Salvador), Venezuela (Caracas)

*Syndrome context:* Urban and peri-urban areas

*Core problems addressed:* Violence and insecurity, access to city and essential services, access to housing, exclusion, fragmentation and new urban poverty, privatisation and deregulation of public resources.

*Involvement of other IPs:* IP1

*Project description:* The study will examine how violence is ‘produced’, how it affects different social groups, and what answers are proposed both by the authorities and by the population. The objective is to determine the social impact of ‘insecurity’. In the framework of this project, concerted strategies for social and territorial security will be defined and tested, involving social groups, local authorities and private corporations, beyond the contemporary phenomenon of an “urbanism of fear”.



Fig. 5  
Violence in poor neighbourhoods and security policies designed for rich areas are on the increase in Latin America. Younger people in particular have resorted to violence, weapons, illegality and trafficking as a form of subsistence (shown here: Caracas, Venezuela). Photo: Yves Pedrazzini

**Project title:** *Social practices of the transformation of urban space: The case of border intermediation in Central America and the Caribbean.*

*Main partner institutions:* FLACSO Dominican Republic, INESA Haiti

*Location:* Border area between Haiti (Ouanaminthe) and the Dominican Republic (Dajabón)

*Syndrome context:* Urban and peri-urban areas

*Core problems addressed:* Access to city and essential services, access to housing, increasing job insecurity and informalisation of the economy, privatisation and deregulation of public resources, concentration of power and crisis of representation, inadequate institutional mechanisms for solving environmental problems, international migration.

*Involvement of other IPs:* None

*Project description:* The central objective of this investigation is the identification and analysis of the impact of urban intermediate functions (social, economic, political, territorial) on social practices related to the transformation of urban space in a borderland context. Research aims to evaluate the real or probable influence of social practices on public policies, and to assess the potential for mitigation of the negative and empowerment of the positive effects of intermediation.



Fig. 6  
Bridge over Mas-  
sacre River cross-  
ing the border  
between Haiti  
(Ouanaminthe)  
and the Dominican  
Republic  
(Dajabón). Twice a  
week a bi-national  
market takes place  
in Dajabón, gener-  
ating frequent traf-  
fic of people and  
merchandises  
across the border.  
Photo: Lena  
Poschet

Fig. 7  
Urban expansion  
competes with  
agricultural land  
use and encroach-  
es on ecological  
reserves around  
the city (shown  
here: Autlán de  
Navarro, Mexico).  
Photo: Silvia  
Hostettler



**Project title:** *Integrated analysis of the impact of urbanisation on natural resource management: A case study of the lower Ayuquila watershed in western Mexico.*

**Partner institutions:** University of Guadalajara, Directorship of the Sierra de Manantlán Biosphere Reserve

**Location:** Mexico (Autlán de Navarro, Jalisco)

**Syndrome context:** Urban and peri-urban areas, highland-lowland areas

**Core problems addressed:** Depletion and contamination of rivers and other water sources, degradation of forest ecosystems, inadequate institutional mechanisms for solving environmental problems, privatisation and deregulation of public resources, international migration.

**Involvement of other IPs:** IP1, IP2, IP3

**Project description:** Research will examine how actors in rural areas manage natural resources, and how these management practices influence and are influenced by the phenomenon of urbanisation. An inter-disciplinary research approach will be adopted to investigate rural-urban interactions in the context of global change. Mitigation strategies will be developed in order to strengthen ongoing activities in watershed and natural resource management at the regional and municipal levels.

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# 11 JACS South America

## Citizenship, Inequity and Environmental Issues in the Andes

Isabelle Milbert, Jaquelina Garrido, Yvan Droz and Frank Muttенzer\*

Fig. 1  
Los Andes,  
Cochabamba,  
Bolivia: Bolivia has  
incredible geo-  
graphic diversity.  
The department of  
Cochabamba is sit-  
uated at the centre  
of Bolivia in the  
altiplano region  
(highland plateau),  
between 2500 and  
3500 m. Photo:  
Marc Hufty, 2003



\* On behalf of all the participants in the workshop held in Cochabamba, Bolivia, in July 2001 (listed in Annex 1, p. 456), and with the participation of Flavia Fiorucci and Christina George

## Abstract

The Andean region is marked by the Cordillera Mountain Range, which marks the western border of the sub-continent. The geography of the region consists of highland areas at the centre, lowlands to the east and coastal systems to the west. The Cordillera opens up to the Amazonian forests along its eastern escarpment. The highland plateau, or *altiplano*, situated between 2500 and 3500 m, is another ecological formation common to the Andean region. The coastal deserts are specific to the southern part of the Andes (Peru, Chile), while the climate of the coastal regions towards the north is tropical humid. In the south-eastern lowlands, the Amazonian basin gives way to unique ecosystems of savannah and dry forests. The present study focuses on Bolivia and Peru, which are characterised by important national and international migration flows, growing urbanisation and uneven development.

The Andean countries have now restored democratic political systems. Governments have promoted participation and decentralisation to the municipal level. However, the persistence of poverty and power inequalities is linked to failures of governance and to a lack of response to social demands. Environmental hazards and conflicts over access to and control of natural resources are on the increase.

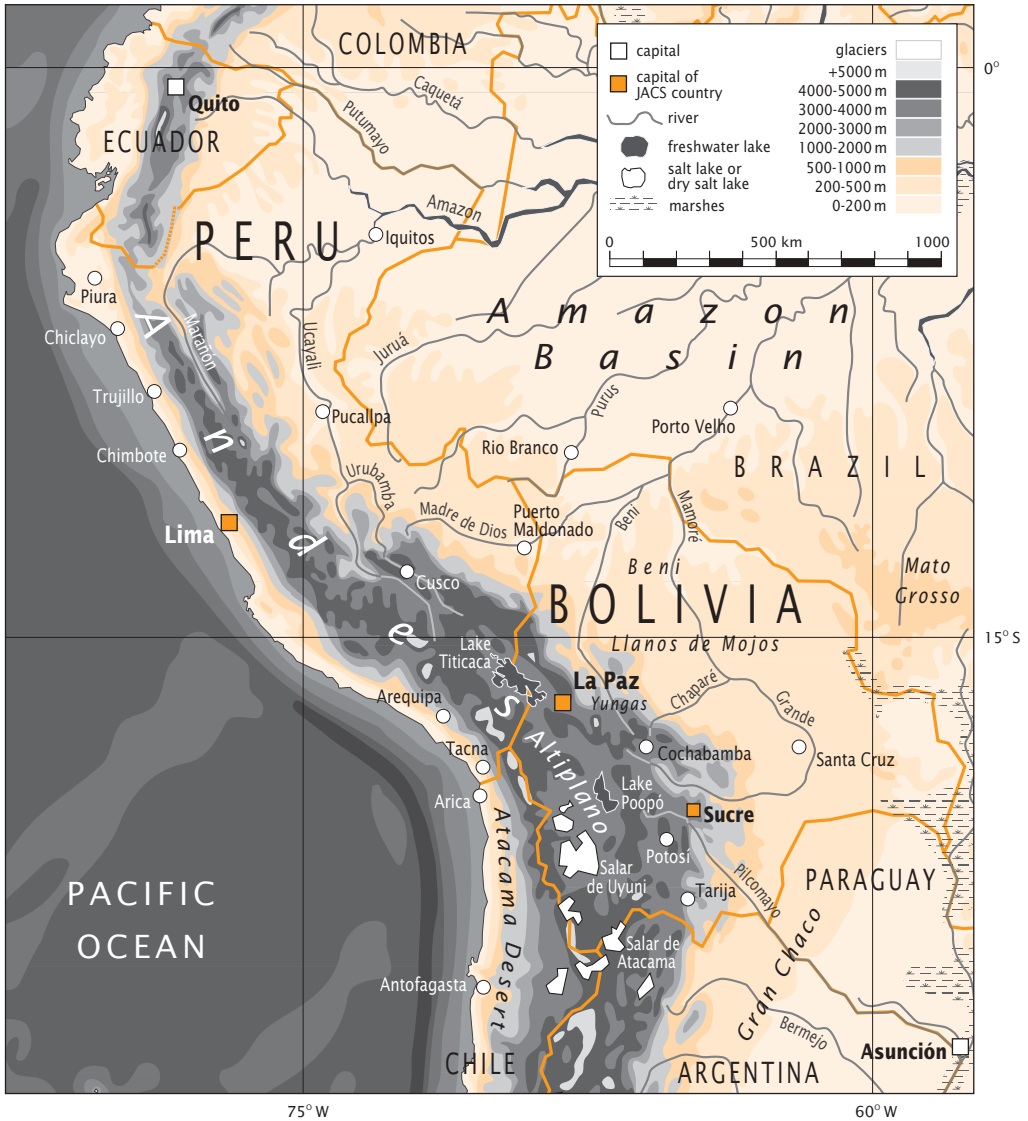


Fig. 2: The JACS South America concentrates on the Andean region, and more specifically on Bolivia and Peru. This area is defined by the Cordillera Mountain Range, which marks the western border of the sub-continent. Its geography is composed of highland areas at the centre, lowlands to the east and coastal systems to the west.

## 11.1 Introduction to the JACS South America region

In its first phase, the JACS South America concentrated on the Andean region, and more specifically on Bolivia and Peru, with elements of comparison in Colombia, Ecuador and Argentina. Bolivia and Peru were chosen as the site of initial research launched by IP8 for several reasons. Among these were: their wealth of biodiversity, transformations in the structure of management and participation, socio-economic evolution and a long history of cooperation with Switzerland. The following chapters will refer as frequently as possible to these two countries.

The Andean region of Latin America is defined by the Cordillera Mountain Range, which marks the western border of the sub-continent and extends from Venezuela to Chile, including Colombia, Ecuador, Peru and Bolivia. The geography of the region is composed of highland areas at the centre, lowlands to the east and coastal systems to the west. Along its eastern escarpment the Cordillera opens up to the Amazonian forests, which occupy 20 to 25 % of the country's territory in the case of Ecuador and Peru, and 48 % in the case of Bolivia. Another ecological formation common to the Andean region is the highland plateau, or *altiplano*, situated between 2500 and 3500 m. The *altiplano* was the centre of pre-Columbian civilisations, and large urban agglomerations such as La Paz, Quito and Cuzco are still situated in this area. The coastal deserts, such as Atacama, Arica and Tacna, are specific to the southern part of the Andes (Peru, Chile), while the climate of the coastal regions towards the north is tropical humid. In the south-eastern lowlands, the Amazonian basin gives way to unique ecosystems of savannah and dry forests, such as the *Chaco* in the border region between Bolivia, Chile and Argentina.

Within their respective eco-regions, the countries have different forms of trans-national geographical integration: Peru and Bolivia in the centre, Ecuador to the north and Chile to the South. Peru, Ecuador and Bolivia have common access to the immense Amazon River system. In the Cordillera, Peru and Bolivia are linked by Lake Titicaca and share parts of the *altiplano*. Peru and Chile share the desert coastal region, thus excluding Bolivia from access to the sea. This configuration of eco-regional interdependence has determined commercial exchanges for centuries and was instrumental in the formation of internal markets in the region after the collapse of Spanish colonialism in the early 1800s.

Most countries in the region, particularly Bolivia and Peru, are characterised by a great diversity of ecosystems. Although national boundaries are determined by the Cordillera Mountain Range, there are also many ecological, socio-economic and cultural similarities between certain groups in the populations of Bolivia, Peru and Ecuador. To a lesser extent, ecological features have had an impact on the institutional dynamics of these three countries, which make many claims to indigenous and regional identity.

Recent constitutional changes in Colombia, Brazil and Peru have emphasised both the right to a healthy, productive environment and the objective of nature conservation.

The two main demographic processes during the second half of the 20<sup>th</sup> century were the displacement of rural dwellers to the region's urban zones, and colonisation activities that expanded the agricultural frontier.

Fragile socio-economic conditions (see Table 1) have been worsened by the growing frequency and magnitude of natural disasters: cyclones, earthquakes, landslides, drought and floods claim several thousand lives every year and destroy rural and urban livelihoods. Climate change and phenomena such as El Niño and La Niña have severe impacts on the population.

The continent is at peace, with no inter-state war since October 1998, when the border conflict between Peru and Ecuador came to an end. However, great social, ethnic and economic disparities have a heavy impact on political life. After suffering for many years from political instability, coups d'état and military regimes, South American countries returned to democracy 20 years ago. This has led to constitutional transformations in Peru, Bolivia and Ecuador. These countries have begun to implement decentralisation policies and specific processes of popular participation. Indigenous populations have developed strong political movements. Nevertheless, several countries have experienced violent episodes of political protest (Argentina, December 2001; Peru, April 2001; Bolivia, February 2002 and 2003).

Table 1

Some key indicators for the countries of the JACS South America.	Year	Bolivia	Peru
	<b>Geography and social indicators</b>		
Surface (thousand sq. km)	2000	1,099	1,285
Total population (million)	2000	8.3	25.7
Annual population growth rate (%)	1990–2000	2.4	1.7
Urban population (% of total population)	2000	65	73
Annual urban growth rate (%)	1990–1995	3.2	2.7
<b>Development and economic indicators</b>			
GDP per capita, at purchasing power parties (USD)	2000	2,424	4,799
HDI rank (total 173)	2002	114	82
Human Poverty Index (% of population below poverty line)	1989–2000	–	49
Population in agriculture male / female (% of labour force)	1998–2000	58/2	–
Public expenditure on education / health (% of total public expenditure)	1995–1997/ 1998	4.9/4.1	2.9/2.4
Population with access to safe water / adequate sanitation (%)	2000	79/66	77/76
<b>Environmental indicators</b>			
Crop land per capita (hectares)	1997–1999	0.29	0.15
Area of severe soil degradation (% of country)	2000	29	33
Protected area (% of total surface)	1999	14.4	2.7
Energy consumption per capita (kilogram of oil equivalent)	1999	562	519

Sources:  
UNDP, 2002;  
World Bank,  
2002a+b;  
FAO, 2000

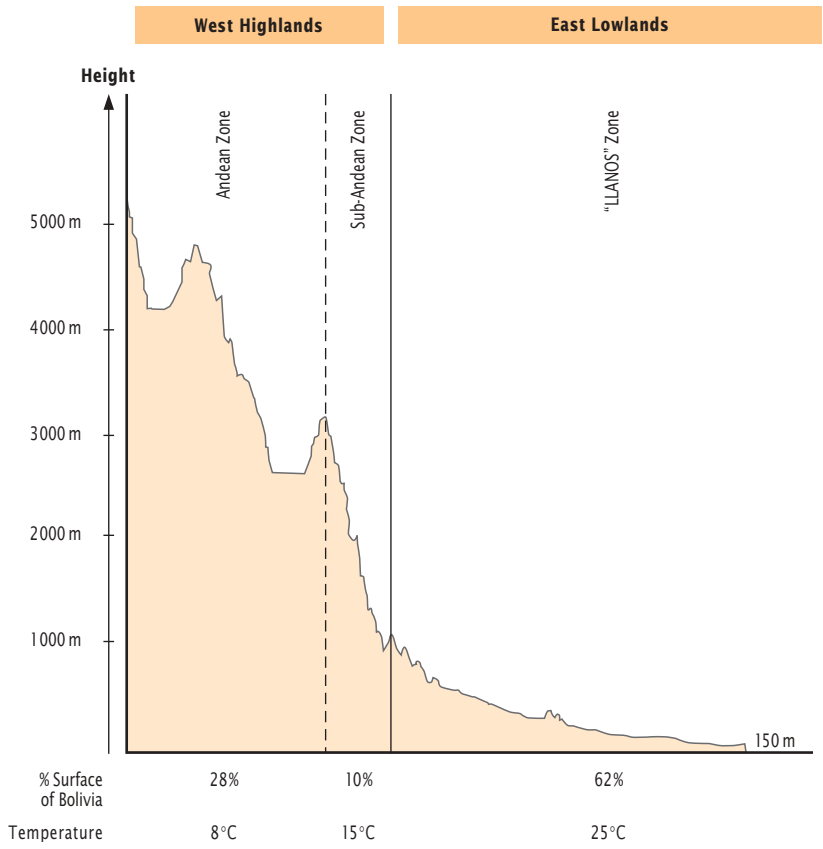


Fig. 3  
West-East transect  
of Bolivia, showing  
the three different  
geographic  
regions.



## 11.2 Selection and explanation of core problems

### 11.2.1 Syndrome contexts

Syndrome contexts were chosen on the basis of geographic, environmental, demographic and socio-economic variables. Diverse factors such as climatic conditions related to altitude, types of land use, migration and demographic concentration, and social and economic structures have been taken into consideration. On the basis of these distinctions, four syndrome contexts were identified: two in rural settings (highlands and lowlands), one characterised by the complex interdependence between highlands and lowlands with respect to resources, population and power structures, and one specific to urban and peri-urban settings.

In the highlands, from 1000 m to 2000 m, a mild, “eternal spring” climate predominates, with tropical vegetation and dry winters. Good cereal cropland has encouraged human settlement between 2000 and 3000 m, although temperatures may easily drop below 0°C. Above this altitude, frozen *tierras heladas* predominate, with potato culture on the *altiplano*, forests and puna in Bolivia (4000–5000 m), and llama, alpaca and sheep breeding. These interlinked dynamics have impacts on population groups in cities, towns and villages who create and invest in networks of small enterprises based on family, patron-client or ethnic affiliations.

A tropical climate predominates in the valleys of the lowlands, below 1000m. However, a large semi-arid zone cuts across South America from the north of Peru to the eastern coast of Patagonia. Aridity has two main causes: on the long narrow coastal stretch, from Peru to Chile, it is due to the Pacific tropical anticyclone, while the arid transversal further inland is due to the barrier created by the Andes Mountains and great distance from the ocean (Urioste and Pacheco, 2001).

The ecological dividing line between lowland and mountain contexts is situated at an altitude of around 1000 m, except for the transition from inter-Andean mountain valleys to the *altiplano* situated at about 2500 m. Points or zones of intersection with very diverse landscapes, such as dry forests and humid forests, mountain valleys and lowland savannah or coastal areas, can be observed at this level. The context of lowland-highland interdependence has been defined with regard to the socio-economic links underlying temporary and permanent migration, as well as exchange of products and services.

For centuries highland-lowland relations have influenced the agrarian system, connected and complementary types of land use, migrations and human settlements.

Population density and concentration is a valid criterion for identifying urban and peri-urban contexts, with a minimal population of 40,000 inhabitants for medium-size towns and 500,000 inhabitants for large agglomerations. Since the 1940s, the region has witnessed dramatic rural-urban migration. During the last 50 years, the ratio of urban to rural population has shifted from 70/30 to 30/70 on average. This has heightened discrepancies in spatial distribution involving natural resources, government investment and productive activities. Today, Lima accounts for more than one-third of the Peruvian population. Even a medium-size city like Cuzco has multiplied 3 times in 40 years. Cities such as Villa El Salvador, near Lima, or El Alto, on the plateau above La Paz, at 4000 m, have mushroomed to a population of several hundred thousand in only a few years (Fernández, 1998).

As a consequence, the socio-economic development process has been limited to specific areas that account for less than half of the region's territory. Internal conflicts arise from rural exodus, rapid and chaotic growth, scarcity of natural and financial resources, and the impossibility of providing adequate services to the urban and peri-urban population (Dory and Manzano, 2002).

Thus, the geographic and ecological diversity of the region means that national boundaries delineate various regional entities among which there is little communication. This situation has posed a challenge to the political elite of the Andean countries since independence, resulting in internal socio-political regionalisation and sometimes armed conflict. For instance, due to centralist policies devised in the coastal capital of Lima at the expense of the rural population of the Cordillera, relations between the Peruvian coast and the Cordillera region have always been tense. The social violence of the 1980s was an expression of this historical dichotomy.

Different paths of development have been determined by and rooted in the different geographical zones of the Andean region in a cyclical pattern. Generally, coherent development policies have been impeded by geographic obstacles. The resulting limitations in the implementation of economic models have created an uneven pattern of growth and failed to provide a basis for strong national markets (Laserna and Mayorga, 2000).

The following criteria were established to define core problems in the syndrome context areas:

- relevance and importance in terms of social and territorial coverage;
- opportunities to test concrete solutions for syndromes of global change within the contexts described above;
- representativeness and urgency for the Andean region as a whole;
- consideration was also given to the fact that many social problems have “positive” aspects which should themselves be taken into account in syndrome mitigation.

Focal problems were first classified according to their importance on a scale of 1 to 7 and entered into a matrix of general and specific relations. The resulting list of core problems was then grouped into 5 major realms.

### **11.2.2 Pertinence of the realms**

Analysis of the political and institutional realm focuses on the relations between the state and civil society, using sector-specific public policies and institutional reform as indicators of democratisation. Specific policy analysis is a key element in understanding the management of natural resources, environmental hazards and provision of basic infrastructure. Sole provision of public goods by state authorities has resulted in failures of governance.

Analysis of the socio-cultural and economic realm addresses economic and socio-cultural aspects of governance with respect to specific problems in the provision of public goods, such as urban infrastructure and sustainable natural resource management. Changes in concepts of justice, participatory procedures and negotiated institutional arrangements in natural resource management, as well as changes in micro-economic processes, serve as indicators of tensions in these areas. At a macro-economic level, Andean economies have been structurally transformed – at the country and sub-regional levels – in the contemporary context of globalisation.

Analysis of demography and livelihoods is particularly important for national societies characterised by great ethnic and regional social diversity and gender-specific division of labour. In rural areas, there are tensions between Western and indigenous concepts (models, logic, representations, ethos) of natural resources and land use management. A livelihoods approach focuses on the impacts of structural adjustment policies and state-centred models of development at the macro level that are changing class structures, employment opportunities and access to health, education and other basic services at the micro level.

Resource use, infrastructure and know-how are key elements in the analysis of interaction between man and nature. Natural resource use and management – whether of water, land or forests – is being rapidly transformed, creating direct conflicts between indigenous people and new settlers, and between public and private actors.

The bio-physical and ecological realm measures the availability of natural resources such as land, vegetation cover and biological diversity. In the urban ecological niche, as well as in rural areas, risks related to natural hazards, climate change and environmental pollution are crucial core problems. Deficiencies in land tenure distribution patterns in rural areas result in increased ecological vulnerability.

The following core problems were identified by the participants in the Cochabamba workshop, and were classified in the 5 major realms.

Table 2

Core problems of the JACS South America.	<b>Realms</b>	<b>Core Problems (CP)</b>
	Political & institutional	Failures of governance Incoherent public policies, lack of response to social demands Conflict over centralisation and decentralisation Exclusion from political participation and emergence of new forms of collective action Power inequalities Conflicts between political and legal cultures Fiscal dependence and lack of autonomy
	Socio-cultural & economic	Social and racial discrimination
		Loss/transformation of ethnic/cultural identities
		Inactive citizenship
		Globalisation
		Changes in the production process
		Flight of financial and human capital Weak and poorly articulated markets
Demography & livelihood	Exclusion and lack of integrative measures	
	Restructuring at the family and community levels	
	Gender inequalities	
	Scarcity of natural resources Degradation of traditional economic relationships	
Resource use, infrastructure & know-how	Conflicts over access to and control of resources	
	Lack of comprehensive vision for management of basic services	
	Insufficient coverage of public services and housing problems	
	Inadequate management of infrastructure and natural resources	
	Lack of management plans and inadequate land use	
	Environmental externalities	
	Growing pollution Environmental hazards and risk	
Bio-physical & ecological	Overexploitation of natural resources (water, land)	
	Forest destruction	

## 11.3 Status and dynamics of core problems

### 11.3.1 Political and institutional realm

Unstable institutions and a political culture of confrontation are two of the main features of governance in the Andes. Although military regimes have disappeared in the last 20 years, the army is still powerful (Lavaud, 1991; Lopez Jimenez, 1999). Democracy is well established, with national and local elections taking place regularly in the region (Secretaría Nacional de Participación Popular, 1996). However, recognition of the rights of much of the population (women, indigenous groups) has been recent, and seldom translated into reality (Olivares, 1996). Many people feel that the process of democratisation has not yet culminated. The tensions in this process of institutional reorganisation are evident in a general context of failure of governance (Tapia and Toranzo, 2000).

In the 1990s, a decentralisation process began in Bolivia and Peru through implementation of laws on popular participation that grant new status, funds and duties to municipalities and social organisations (Vargas, 1997; Medina, 1997; Revesz, 2000). Quite a few achievements have been attained. The success of decentralisation will depend on whether it takes account of social demands and creates new economic and social dynamism at the local level. At present, the process of decentralisation frequently comes into conflict with centralised institutions. For example, in Bolivia, Prefects are nominated by the President of the Republic and assisted by technical experts. They must deal with elected city councils on many sensitive issues related to land use, basic services (education) and resource management. Moreover, municipal finances are still controlled by the central government.

One reason for the current political situation – apart from the impact of extremist movements or economic crises that affect political institutions – is weak articulation on the part of various institutions (PRONAGOB, 2001). For example, the overlapping of legislative, executive and judiciary powers within the state apparatus creates many political problems; the lack of coordination between national, departmental and municipal levels dilutes power and resources. Furthermore, rural highlands and Amazonian lowlands lack administrative capacity and competence, which are concentrated in major cities (Urioste and Pacheco, 2001; Rojas, 2000). Thus, local development plans lack popular legitimacy when they are designed without regard to local realities. Behind this evolution is a more traditional political culture charac-

terised by corruption, patriarchalism and clientelism, with the concomitant loss of credibility for political institutions. Inadequate public policies are inconsistent with social demands. Ultimately, popular demands are considered only as a result of popular protest and upheaval (Blanes and Galindo, 1993).

Fig. 4  
Comunidad María  
Auxiliadora  
(Cochabamba,  
Bolivia): Self-  
development  
project run by a  
group of women.  
The indigenous  
population has  
long been margin-  
alised in Peru and  
Bolivia, and gen-  
der inequalities are  
very evident in the  
region.  
Photo: Marc Hufty,  
2003



Despite these harsh realities, important changes are taking place: new actors are appearing on the political scene. For example, in the 1995 Bolivian local elections, 29% of the councillors elected were peasants and Indians. This is an enormous change in political realities in Bolivia, even if this percentage is lower than that of the overall Indian population. Peasant and Indian communities are now recognised as legitimate political actors, and a quota law mandates a 30% representation for women in political bodies (Calderón, 1999a; Calla et al., 2002). However, this evolution has not ended the political exclusion of Indians, peasants and the poor, which has economic, cultural and political roots. Until the constitutional reform of 1978, indigenous people in Peru were granted the right to vote only if they could read and write. In Bolivia, the law recognises only political parties with national representa-

tion. This has long prevented the rise of parties that represent local or geographical interests (Andes versus Amazonia; *altiplano* versus Santa Cruz). In summary, persistent power inequalities, conflicts among political cultures and struggles for legitimacy remain prevalent in the Andes (Farah, 2000; Muñoz, 2000; Rocha, 1999).

### 11.3.2 Socio-cultural and economic realm

Today, globalisation is a reality in the Andes, which have experienced years of structural adjustment (CEDLA, 1995; Fundación MILENIO, 1998, 2000). One side effect of globalisation is the exhaustion of the old economic model based on exploitation of natural resources (gold, silver, pewter, cotton, guano, etc.) which have now become scarce and/or have been affected by a collapse in prices in the global market (Chávez and Toranzo, 1993).

Local economies in the Andean countries are based on agriculture, especially family farming, that is highly dependent on the climate (e.g. 40 % of the Bolivian population is rural). Two global trends can be distinguished: highland family farming, and a new form of export-oriented *latifundio* in lowland areas (Demeure, 1999; Fernández, 2000).

Parcelling has a twofold effect: it is a strong motivating factor for migration to cities and foreign countries (Argentina, USA, Spain, etc.), and it has weakened community-based productive structures. Export-oriented *latifundios* create new economic flows that bypass national economies, resulting in the creation of so-called off-shore wealth.

Like other parts of the world, the Andean region presents a dualistic pattern of socio-cultural statistics. Middle-class urban neighbourhoods have a relatively good standard of education, efficient basic services and health services, and a high level of employment compared to deteriorated city centres, makeshift peri-urban squatter settlements and rural areas, both in the highlands and the lowlands. Moreover, cities face greater environmental risks and violence. The same is true for gender inequality, where statistics show a higher rate of domestic violence in urban and peri-urban areas (Revollo, 1995; Pérez, 2001).

Racism is a latent problem in the Andes. Recently, it has been addressed by indigenous movements, especially the Aymara, who consider present political institutions typical of a colonial state. The (re)emergence of indigenous



movements is a response to the process of acculturation of ethnic identities linked with migration to cities, and to the political aim of the state to absorb ethnic groups (Ticona, 2000; Rocha, 1999). Given this situation, the constitution – or creation – of national identities is an on-going process. It is not possible to speak of national “imagined communities” (Anderson, 1991) in either of these Andean countries, but rather of several ethnic communities yet to be merged into an integrated nation.

### 11.3.3 Demography and livelihood

The *Conquista* was followed by a demographic disaster. In Peru, for instance, the population dropped from 10 million to 3 million between 1530 and 1580, which says a great deal about the state of the vanquished indigenous population. Today there are demographic zones of stability comprised of concentrated groups of pre-Columbian origin and of coastal settlements the origins of which date from the time of European colonisation (Urquiola, 1999).

South America experienced its most rapid demographic growth between 1950 and 1965 (2.8%). In extreme cases such as Bolivia, a very high birth rate – close to 40 per thousand – continued for two decades, while the mortality rate was declining rapidly (PNUD, 1998, 2000).

Declining prices in the agricultural and mining sectors and a continual rise in unemployment have contributed to a deep social crisis, which has triggered significant national and international migration flows. In recent years, the economic situation of most South American countries has been characterised by stagnating GDP, rising external debt, dollarisation, privatisation, capital evasion and trade imbalances (Prudencio, 1996).

Underemployment affects a high percentage of the population (42% in Peru). Indeed, almost half of the population, especially young people and women, have difficulties finding a job and lack opportunities for employment commensurate with their educational qualifications and aspirations (Wanderley, 1995). Housing is also a major problem: for example, Peru needs an additional 1.3 million houses, while a high proportion of existing houses are inadequate by acceptable standards.



Fig. 5  
Tarata, province of  
Cochabamba,  
Bolivia. The village  
of Tarata is situat-  
ed 30 km from  
Cochabamba.  
Photo: Marc Hufty,  
2003

Poverty, including extreme poverty, is a major problem in the Andean region. Despite several years of economic growth, poverty levels remain high: in Peru, between 15 and 20% of the population lives below the absolute poverty level and suffers from substandard education, poor access to health services and a high rate of infant mortality. The high rate of endemic poverty in Andean countries implies political, cultural and economic exclusion (Instituto Prisma, 2000).

As already mentioned, territorial organisation plays a major role in the Andean countries. This is due to the sharp physical contrasts in this area of the world. Great economic and social differences exist between the three main ecological areas of the region: the Andes, the Amazon and the coast. This ecological complementarity, known as a vertical archipelago, was and still is exploited by the population, which makes use of different ecological regions to cultivate various plants and rear large flocks. A socio-geographic zone is thus construed as an articulation of a series of separate configurations (Izko, 1998).

#### 11.3.4 Resource use, infrastructure and know-how

Mining and forest logging have historically been of central importance in South America. The agrarian *conquista* took place in Brazil, on the Atlantic front, and in the Cordillera, through the clearing of forests. This type of agriculture has expanded until today, in conformity with the development of a continent that values exports and immediate economic return, and where most economic actors have little concern for sustainable development (Muñoz, 2000; Montes de Oca, 1997; Rist, 2002).

Institutional reforms in the Andean states have led to the implementation of policies the objective of which is to change the legal rules concerning access to resources and land use management. Private sector participation has been a priority for new resource management systems, resulting in increased pressure on resources, huge social costs and generation of new conflicts of interest. However, Bolivia has been experiencing a major shift in forest management since the introduction of a new forestry law in 1996. Various changes have been introduced, including mode of payment, certification models and granting of exclusive rights of use to communities. The law gives communities preferential rights to utilise forested areas on agrarian properties that they possess. It grants parcels of up to 100,000 hectares to indigenous groups, which allows for major sections of forest to be managed under a sustainable community-based model.

Forest and biodiversity exploitation creates violent conflicts among indigenous groups and can destroy fragile ecosystems. For example, Peru is known for its “megabiodiversity”, which includes 84 of 104 life zones, and it is also home to one of the Vavilov centres (places of origin of agricultural species). However, this very rich biodiversity is threatened by overexploitation of soil (chemical fertilisation, erosion, salinisation, etc.), river contamination (extraction of cocaine and gold), and climate change (e.g. El Niño). Added to this is the problem of air, water and soil pollution around big cities (Lima, La Paz, Cochabamba, Santa Cruz, etc.), a situation worsened by migration from rural areas. Exploitation of oil and gas in the Amazonian region also constitutes a risk to natural resources and biodiversity. This economic exploitation has heavy impacts on indigenous populations. Within this depressing economic and ecological context, acute conflicts over access to and control of natural resources arise among local groups, and especially between ethnic groups and national actors (Tapia, 1996).



At present, the construction of inland waterways, roadways (such as Santa Cruz-Puerto Suarez) and gas and oil pipelines from production sites to export facilities or to neighbouring countries is a threat to the region's ecosystems. Engineering projects, such as the one concerned with transport and export of Tarija gas through the Andes to the Chilean seashore and to North America, are a cause of irreversible change in the socio-economic equilibrium of indigenous populations as well as in delicate ecosystems.

### 11.3.5 Bio-physical and ecological realm

In Chile, Peru and Bolivia, recent attempts to privatise water management have led to conflicts between industrial managers and local communities, owing to the incompatibility of vested interests with respect to resource use. Several other examples of conflicts in the region show that the global changes imposed on local societies are giving rise to a social demand for institutional re-arrangements and allowing for a fair negotiation of the various interests at stake.

In any case, technological and legal changes in resource management are linked with the policy of decentralisation and processes that aim to promote participation by the population in local development planning (Superintendencia Forestal, 2001; Aramayo and Guerrero, 1998).

In the last two decades, the economic centre of Bolivia has moved from the Andes to the lowlands of the Amazon and the *chaco*, thereby putting an end to predominant exploitation of mineral resources in the Cordillera and setting the stage for the opening of a new frontier of fossil, agro-industrial and forest resources in the lowlands. However, this change has failed to bring

Fig. 6  
Peruvian Amazon:  
The forest is at  
constant risk  
owing to multiple  
interests and  
actors involved in  
its exploitation.  
Photo: Marc  
Galvin, 2002

about strategies for keeping highland economies stable, and has therefore led to an increase of migration from the highlands to the Amazon basin and to the coca economy, involving Bolivia, Peru and Colombia. The process of construction within and between eco-regions is expressed in different forms of lowland-highland interdependence, each of which is affected differently by globalisation (Paz, 1996).

Actual and potential land use management in the Andean countries currently suffers from the impact of international market conditions. There is great pressure for exploitation of forest and subsurface resources at the Amazonian frontier in the east and fish stocks along the Pacific coast, and for production of export crops in some of the coastal and central regions. The dynamics of land use are also related to demographic pressure, in particular in the central highlands. Soil erosion, land degradation and the search for new lands and/or employment opportunities are some of the causes of peasant migration from the *altiplano* towards urban agglomerations, coastal areas and the Amazonian lowlands. The conversion of lowland forests into agricultural lands has led to conflicts between different stakeholders, given that the indigenous economies of the eastern part of Peru and Bolivia are often based on the forest (horticulture, hunting and gathering) and not on agriculture (AGENDA: PERU, 2000). In other cases, industrial exploitation of forests has led to the displacement of agricultural communities. Coca culture as an illegal but profitable export has helped to exacerbate conflicts. These tense social relations take place in a countryside described as “a museum of land tenure systems”, with superposition of diverse forms of exploitation and employment and the persistence of traditional community work (Rouquié, 1998).



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Fig. 7  
*Altiplano* region,  
Bolivia: Soil  
erosion, loss of  
fertility and search  
for new opportuni-  
ties are the causes  
of migration.  
Photo: Marc Hufty

## 11.4 Synopsis and syndrome contexts

Gender inequalities, difficult access to citizenship and access to natural resources have been identified as transversal core problems in the different syndrome contexts. Economic imbalances and family restructuring cause great gender inequities.

### 11.4.1 Highlands

The most serious problem in the Andean highland areas appears to be power inequalities and the marginality of the rural Indian population. Dual management of natural resources, inadequate project management and rural development that is dependent on aid create many difficulties for the rural population, which is also suffering from racial discrimination and social exclusion. Conflicts appear, at the judicial-institutional level, between traditional local use and state or private initiatives such as infrastructure projects.

Second in importance is access to natural resources, particularly insufficient land and contaminated water. This has been linked to the multiplication of *minifundio*, desertification and land erosion.

Third is the lack of political governance, which has many implications. Chief among these are contradictions between the political mandate given to the local representatives and the functioning of local political systems.

Several factors contribute greatly to keeping local rural populations deeply in poverty. Chief among these are contradictions between traditional rules of reciprocity and market logic, insufficient commercialisation of rural products, minimal access to basic services and infrastructure, and a progressive loss of financial assets. There is a great need for integration in the case of interrelated problems: for instance, medicine fails to integrate traditional and modern knowledge. Public policies do not integrate public health injunctions, as in the case of prevention of the Chaga's disease, which would require alternative methods of constructing housing.



Fig. 8  
Comunidad María  
Auxiliadora,  
Cochabamba,  
Bolivia:  
Grocery shop.  
Photo: Marc  
Hufty, 2003

#### 11.4.2 Lowlands

In the Andean lowlands, power inequalities in the struggle for access to land and natural resources are so pronounced that a portion of the population has become marginalised. An authoritarian “colonial” mentality predominates, accompanied by weak institutions and poor governance. The consequences are contradictory policies and lack of implementation.

The marginalised population lacks access to information, while its local knowledge is ignored. Exhaustion of non-renewable natural resources, loss of biodiversity, soil degradation and deforestation are the central problems that must be confronted.

#### 11.4.3 Highlands-lowlands

Relations between highland and lowland areas involve several aspects of public policy: inadequate social policies, food security, innovative policies unrelated to the reality of local agriculture, conflicting projects undertaken by municipal management and NGOs with local organisations, and the delicate balance between urban and rural policies.



Institutions are also being challenged by new political organisations and new social demands. Dynamic social, economic, cultural and technical innovations are taking place in direct confrontation with state structures. Decentralisation is changing the power equilibrium by introducing new elites, advancing regionalism and triggering tensions between local institutions and other levels of government. New conflicts are arising: communitarianism vs. modernity, globalisation vs. citizenship, and disparities in social representation between urban, peasant and indigenous peoples with regard to territorial management and management of natural resources.

Global climate change has an impact on agricultural cycles, partly due to reduced and irregular rainfall in the lowlands and the highlands. Deforestation in the lowlands, severe land degradation and exhaustion of natural resources in the highlands are responsible for growing demographic and economic pressure on natural resources in the lowlands, especially as the result of differing applications of land reform in the lowlands and the highlands. The market economy and openness to international exchanges create diverse challenges, particularly with respect to coexistence with the traditional economy, the great diversity in ecological conditions and sustainable management of natural resources.

Rural and urban relations can be understood in the light of survival strategies. But cultural and generational clashes are also taking place in a context of changing ways of life and new approaches to management of the environment.

#### **11.4.4 Urban and peri-urban**

Many people in urban areas suffer from poverty and vulnerability, and are victims of violence and social and political exclusion as well. The lack of integration between society and the state is evident in terms of inactive citizenship, patriarchalism, clientelism, the reproduction cycles of the urban elite and inadequate education and health services linked with poverty.

The shortcomings of urban management are apparent with regard to lack of infrastructure and basic urban services (especially water), inadequate land use, increasing environmental hazards and destruction of historic city cen-



Fig. 9  
Region of Cochabamba, Bolivia: Most of the Bolivian population is affected by poverty and vulnerability of all types (violence, lack of infrastructure, unemployment, housing shortages).  
Photo: Marc Hufty, 2002

tres. The lack of self-help organisations reinforces vulnerability. In the absence of consumer or producer organisations, many city dwellers are isolated and exposed to urban environmental hazards.

Urban violence takes many forms: racism, eviction, family violence and instability. Many activities persist illegally, particularly drug trafficking (Laserna, 1994). Precariousness is reinforced by the shortage of economic opportunities.

Table 3

Core problems (1 for each realm)	Syndrome context			
	Highland	Lowland	Highland – lowland	Urban/peri-urban
Power inequalities	very high	high	high	very high
Access to citizenship	very high	very high	very high	very high
Persistence of poverty and vulnerability	very high	very high	high	very high
Sharing and management of resources	very high	very high	high	high
Environmental risk	high	very high	high	very high

Impact of the most important core problems in the JACS South America syndrome contexts.

## 11.5 Proposed mitigation research

During the workshop held in Cochabamba in July 2001, a total of 45 research themes were formulated. An overview of the most important themes in each of the scientific realms is presented below.

### 11.5.1 Political and institutional realm

Research on political transition, democracy building and governmental reform, including decentralisation and regional development, was well developed in the 1980s and 1990s (Mayorga, 1995; Lazarte, 1993, 2000). Participation by local actors and economic actors involved in development, especially at the local level, has been encouraged (Laserna, 1992; Medina, 1997). Numerous case studies on local dynamics have been carried out (Oporto, 1998; Blanes and Galindo, 1993).

In the mid-1990s, studies focused on local governments and their capacity to assume the responsibilities given to them by legislation on decentralisation. For instance, the Bolivian “Ley de Participación Popular” and the “Ley de Decentralización Administrativa” have received international recognition as models of laws in this field. In the same period, Peru, Colombia, Ecuador and Argentina also actively promoted legal measures and policies aiming at strengthening local government. Research in this area has included studies on local-regional-state relationships, as well as studies on local citizens’ groups (Ardaya, 1998; Peláez, 1995).

Numerous research themes were proposed in this realm during the Cochabamba seminar. Although laws on decentralisation have been passed at the national level, a centralist culture with traditional power methods persists, while new models of power and negotiating methods are appearing at the local level. This process seems to be multiplying negotiable issues and alliances. The population, local institutions, and national and international actors need be taken into consideration.

Recently, several researchers have concentrated their studies on conflicts between law and legitimacy, citizenship, political exclusion and conflict between political cultures (Medina, 1997; Pinedo and Toranzo, 1994; Vargas, 1997). Political parties, the electoral system and elections have been closely followed and studied (Lavaud, 1991; Rojas, 2000; Crabtree and Thomas, 1999). There is now a need for research on the constitution of lead-

ership, particularly in a conflictive context, where themes and actors are now emerging. Conflicts can also be studied from the perspective of discourse. The question of the integration of youth and women in national politics appears crucial. Political decentralisation would allow the integration of actors traditionally marginalised politically, such as women. Moreover, newly emerging ethnic actors are challenging present forms of political representation.



Fig. 10  
Gender team  
work, IP8.  
Photo: Marc  
Galvin, 2003

There is a lack of adequate research on public policy, apart from a few studies on education and health policies (there is virtually no research on environmental risk management policy in Bolivia, and little more in Peru).

### 11.5.2 Socio-cultural and economic realm

UNDP, international agencies, NGOs and the state have used consultancies to develop a number of statistical tools and studies on social inequity, citizenship, exclusion and vulnerability. These themes are familiar in UNDP studies. Ethnicity and gender dimensions have not been overlooked, especially from the perspective of public policy dealing with social participation, integration in the labour force and the family (Escóbar, 1993).

The study of social policies was encouraged by the state, primarily to measure access to health, education and employment. Research on ethnicity and indigenous culture developed in the 1990s, with a focus on both highlands and lowlands, and often with practical objectives such as education (Albó, 1999; CEBIAE, 2000). The concept of citizenship has been approached

from a legal and institutional perspective, and is often linked with popular participation and political reform (Ardaya, 1998; Pinedo and Toranzo, 1994).

Economics and macroeconomic policies, including structural adjustment, have been closely followed in all countries of the region (Prudencio, 1996; Morales and Sachs, 1990). For Peru and Bolivia, there are a wealth of studies related to monetary questions, sector analysis, structural adjustment and globalisation under the supervision of UNDP and CEDLA.

Future research should take into account the importance of the cultural and ethical basis of the concept of “work” in relation to economic behaviour in Bolivian cities. Related points are the question of the cultural, social and economic causes of corruption, and social behaviour in relation to ethics.

There is a need to study the role of NGOs (religious, ecological, development) in the management of health, urban hazards, gender issues and deforestation. New investigations should also address the topic of research on indigenous citizenship reconfigurations in a context where indigenous collective action develops at a global level, with the objective of strengthening local action.

### **11.5.3 Demography and livelihood**

Case studies have shown the role of the informal sector since the 1980s, especially in the cities, with respect to agro-activities in highlands. These studies have now been more closely related to environmental, micro-enterprise and gender issues (Wanderley, 1995). The socio-political implications of economic growth induced by drug traffic have also been studied (Laserna, 1994). Migration has been studied both internally (from lowlands to highlands) and internationally, with consideration of both economic and cultural components (Colegio de Sociólogos de Bolivia, 1999).

Conflicts linked with environment, economic development and struggle for access to economic resources have been revealed in papers encouraged by FAO, SDC (COSUDE) and NGOs. Much of this documentation still remains unpublished.



Fig. 11  
Altiplano area,  
Bolivia:  
Many of the  
region's houses  
are characterised  
by lack of  
infrastructure  
and facilities.  
Photo:  
Marc Hufty, 2002

Some research proposals referred to study of the “migrant *archipelago*”, a permanent structure in survival strategy. Family units may be able to reproduce various national and international ecological and social levels and spheres. It is also important to study population movements and the subsistence economy and its impact on communitarian organisation, in terms of how population movements influence the subsistence economy in highland, lowland and urban zones.

Among the many proposals for work on gender, one takes account of familial (de)structuration and violence. The new power balance in Andean families, due to the greater economic power of women, produces further conflicts between men and women. When personal ideals no longer match social reality, there are questions about the impacts on family, health and education issues.

#### **11.5.4 Resource use, infrastructure and know-how**

Natural resources management was first investigated in relation to land, especially from an agronomic perspective, during the 1980s. The question of forestry and community management then arose, along with communal and water issues. Many local studies take account of the population's specific approach. Others examine the issue of local perspectives in the management of natural resources, from the point of view of forestry (Ascarrunz and Bejarano, 1994).

Few investigations establish a link between public policy and local management of infrastructure. This is also true of management policies on environmental hazards, most of which are case studies. A global synthetic perspective seems to be missing.

Regions and municipalities have financed a number of studies done by consultants and NGOs at the micro level. These can often be considered as a basis for future elaboration of participatory policies, as well as national and urban planning documents. Considering the large number of environmental crises that Peru and Bolivia have experienced in recent years, studies should be undertaken of how to integrate environmental hazard prevention in public policy, with a focus on responsibility for environmental crisis management. The occurrence of environmental hazards might influence the formulation of public policy and official visions of short- and long-term intervention. Thus, environmental crises may have a direct impact not only on governance, but also on politics. Environmental hazards are usually perceived by the population and its leaders, but there is a need to study elaboration of links with corresponding sets of policies (formulation, plan, implementation and funding).

A good example of the growing conflict involving the environment, economic constraints, dependence and social issues is the debate over the use of natural resources. For instance, gas is a strategic natural resource with potential for the Bolivian economy, which will affect the power structure, the process of human development and governance. There is a need for research on the relation between supply of and demand for gas at the global level, and the consequences for sustainable development in Bolivia.

### **11.5.5 Bio-physical and ecological realm**

Land degradation and conflicts over forests and the use of water have consequences not only for exploitation but also for the simultaneous practice of diverse and contradictory types of land use.

The main factors in success or failure in the planning and management of protected areas in the Andean region should be studied, in order to mitigate insecure forms of existence, conflicts over the use of resources, loss of biodiversity, deforestation and recurring mistakes in the design of protected areas.

There is a need for research that aims to identify obstacles and opportunities in the sustainable management of hydrous resources, and the capacity for developing negotiation mechanisms between actors that link rural and urban demands.

The Cochabamba team identified the need to redefine the idea of ecological levels, linking it with the new economy (regionalisation, globalisation, cocaine economy, urban surroundings, etc.). The hypothesis is that Andean individuals and groups are reproducing old survival strategies at a market scale for the sake of securing access to resources and services.

## **Conclusion**

The Cochabamba workshop produced a dynamic dialogue in which research issues were concentrated in a matrix composed of 6 key themes corresponding to the priorities set by the participants: citizenship, gender, models for management of renewable resources, ethics, public policy as a mitigation tool and urban environmental risk management.



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## 12 JACS Alps

# An Integrated View of the Dynamics of Regional Development as a Basis for Mutual Learning

Karina Liechti and Urs Wiesmann

Fig. 1  
The community of Grindelwald, where a long history of tourism development has resulted in a subtle balance of tourism and agriculture, which is now endangered by exogenous and endogenous forces and trends.  
Photo: Urs Wiesmann, 1987



## **Abstract**

In contrast with the other JACS regions, the JACS Alps has a special, subordinate position within the conceptual framework of the NCCR North-South. Therefore, a regional workshop and related pre-synthesis for the JACS Alps was not foreseen in the framework of the SPSP project. The present brief contribution is thus not based on a transdisciplinary process, like the pre-syntheses from the other JACS regions, but attempts instead to address some of the core steps in such a pre-synthesis for comparative reasons, by drawing on literature and expertise. It deals with three sub-contexts within the dominant highland-lowland context: areas of concentration, deserted areas and recreational areas. A preliminary appraisal of core problems related to non-sustainable development in these three sub-contexts showed that the problems were less severe than in the other JACS regions. But the appraisal also hinted at potential syndromes of global change in the Alps. The status of research in the JACS Alps made it possible to concentrate on the key question of the balance between exogenous and endogenous forces, and the potential for guiding regional and local development. It thus provides a basis for exchange and mutual learning with other JACS regions. Recently this potential has been further enhanced through close, concrete collaboration with the newly established Jungfrau-Aletsch-Bietschhorn World Natural Heritage Site in the Swiss Alps.

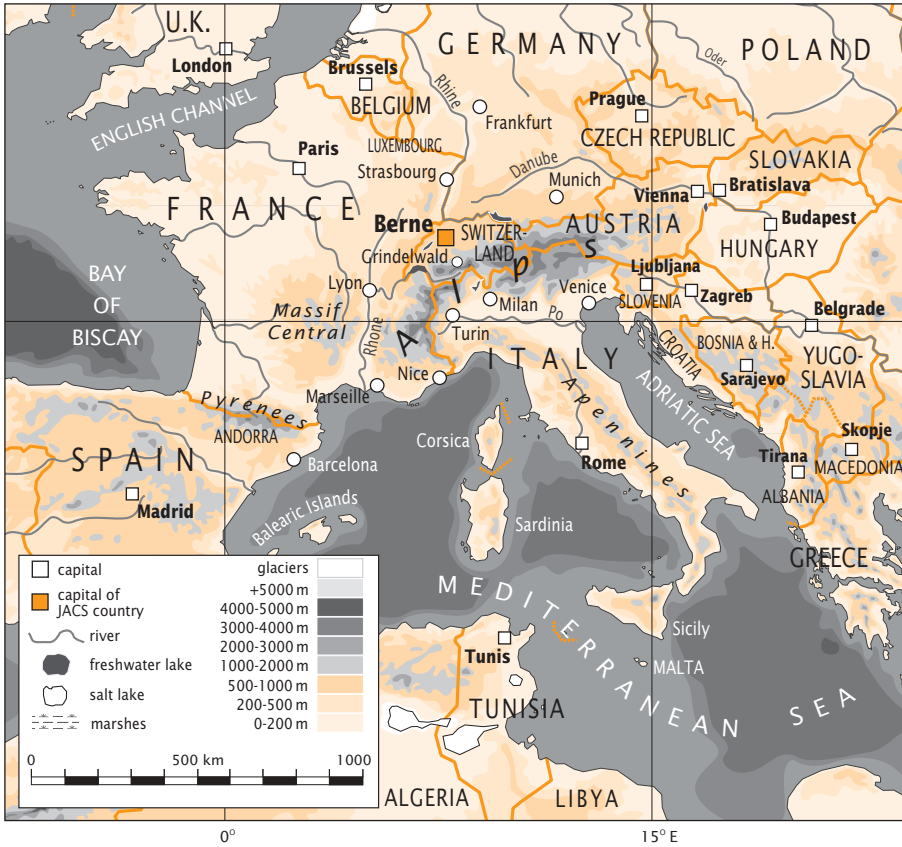


Fig. 2: The Alps, situated at the heart of Europe, are home to many different cultural and linguistic groups. Historically speaking, the Alps have been both a bridge and a dividing element between two high-potential core regions of Europe: the Rhine basin to the north and the plain of the Po river to the south.



## **12.1 The special position of the JACS Alps in the NCCR North-South**

The Joint Area of Case Studies (JACS) for the Alps builds on the long-term experience of several NCCR North-South partners in alpine research. The JACS Alps focuses on syndrome analysis and mitigation in the Alps as a peripheral, sensitive and valuable area within a global core region of economic development and globalisation. The JACS Alps is also an historic example of problematic interactions involving human development and the environment. It therefore complements the eight other JACS, which are all located in developing and transition countries. Against this background, the JACS Alps was not selected as a core region of NCCR North-South research, but as a region useful for promoting exchange and mutual learning among partners from the South and the North, with a focus on syndrome analysis and mitigation.

Given the special and subordinate position of the JACS Alps in the NCCR North-South, no regional workshop and pre-synthesis report in accordance with the methodology outline in Chapter 3 was foreseen by the SPSP project. The present brief contribution should thus not be regarded as a full-fledged pre-synthesis report, but as an attempt to provide a basis for comparing and contrasting core problems in non-sustainable development and related syndrome mitigation research with problems in the other JACS regions. It draws on the expertise of the long-term inter- and transdisciplinary UNESCO Man and Biosphere Programme in the Swiss Alps (Bätzing, 1991; Messerli, 1989; Wiesmann, 1986, 1988, 2001), and more recently on activities related to the management of the Jungfrau-Aletsch-Bietschhorn World Natural Heritage Site in the Swiss Alps (UNESCO, 2003; Hammer, 2001; Verein UNESCO-Weltnaturerbe Jungfrau-Aletsch-Bietschhorn, 2002).

## 12.2 The JACS Alps and its syndrome contexts

Table 1

	Year	Switzerland
<b>Geography and social indicators</b>		
Surface (thousand sq. km)	2000	41
Total population (million)	2000	7.2
Annual population growth rate (%)	1990–2000	0.7
Urban population (% of total population)	2000	68
Annual urban growth rate (%)	1990–1995	–
<b>Development and economic indicators</b>		
GDP per capita, at purchasing power parities (USD)	2000	28769
HDI rank (total 173)	2002	11
Human Poverty Index (% of population below poverty line)	1989–2000	–
Population in agriculture male / female (% of labour force)	1998–2000	5/4
Public expenditure on education / health (% of total public expenditure)	1995–1997/1998	5.4/7.6
Population with access to safe water / adequate sanitation (%)	2000	100/100
<b>Environmental indicators</b>		
Crop land per capita (hectares)	1997–1999	0.06
Area of severe soil degradation (% of country)	2000	0
Protected area (% of total surface)	1999	26.9
Energy consumption per capita (kilogram of oil equivalent)	1999	3738

Some key indicators for Switzerland (JACS Alps).

Sources:  
UNDP, 2002;  
World Bank,  
2002a+b;  
FAO, 2000

As defined by the Alpine Convention (Bätzing, 1994a), the Alps cover an area of about 191,287 km<sup>2</sup>, including parts of eight countries: Switzerland, Austria, Italy, Germany, France, Slovenia, Monaco and Liechtenstein. The Alps are currently inhabited by 13 million people, who represent a variety of cultures and languages. In addition to diverse ecological conditions, the Alps are characterised by a great diversity of natural and cultural landscapes.

Many studies have highlighted the key role of agrarian mountain cultures, traditional agriculture and adapted land use systems in creating and maintaining diversity and uniqueness in the Alps (e.g. Bätzing, 1994b). These agrarian systems developed over a period of more than 1000 years and were based on the complementary functions of mountain agricultural and livestock production, in contrast to the surrounding higher-potential lowlands. In addition, the Alps were traditionally not only a border or dividing element but also a bridge between two high-potential core regions of Europe, namely the Rhine region to the north and the plain of the Po River to the south. Transalpine trade and cultural exchange played a continually important role in the development of the Alps.

Fig. 3  
Mountain agriculture has developed and stabilised over a long period, creating a cultural landscape of great natural value that is now endangered by current trends in agrarian structures and policies (Bussalp). Photo: Urs Wiesmann, 1987



The Alps began to lose their supplementary position in European agricultural production at the beginning of the 19th century. Marginalisation and impoverishment developed in many mountain areas. In subsequent centuries, the Alps increasingly became a peripheral region in a rapidly developing Europe. However, transit functions, as well as production of energy for and trade between the growing industrial centres in the surrounding lowlands, became important in some parts of the Alps. And beginning in the mid-19<sup>th</sup> century, tourism started to develop as a new form of use of alpine landscapes and resources, playing a major role in many alpine regions.



Fig. 4  
Historically the Alps have been more than just a peripheral area: they have served as important bridges between major European centres, thereby creating a significant and valuable cultural heritage (Niedergesteln).

Photo: Urs Wiesmann, 2003

These trends of marginalisation and selective development have continued, with some variation, to the present day, creating differentiated paths and patterns of development in various parts of the Alps (Bätzing et al., 1995). These different paths and patterns can be used to define syndrome sub-contexts for the highland-lowland context of the JACS Alps. It must be noted, however, that the contexts described below are not the result of interdisciplinary discussion in a JACS workshop but initial proposals based on literature and expertise.

*1. Areas of concentration in the highland-lowland syndrome context of the Alps:* These regions are characterised by highly concentrated economic activity and infrastructure, as well as growing populations and the related problems of planning and overused and polluted resources. They are found mainly in the footzones bordering the Alps towards the economic core regions to the north and the south (Perlik and Bätzing, 1999) and on valley floors along the major transit routes crossing the Alps. In some cases they encompass more remote parts of the Alps, e.g. in the case of hydroelectric energy production.

*2. Deserted areas in the highland-lowland syndrome context of the Alps:* These regions traditionally lived on mountain agriculture, with a considerable portion of subsistence production in relatively marginal areas. With the coming of industrialisation and consequently a relative decline in the value of agrarian production, these regions became more and more marginalised, leading to out-migration and in some cases complete desertion of traditional land use systems. Loss of cultural landscape and biodiversity as well as increased risk from natural hazards can be observed, as a consequence of the retreat from agriculture with high levels of labour input. These regions are found mainly in remote parts of the Alps where accessibility is limited.

*3. Recreational areas in the highland-lowland syndrome context of the Alps:* These are regions in which marginalisation of traditional mountain agriculture was counterbalanced by the development of tourism at international and/or national scales, and where sub-centres of economic development emerged in the inner parts of the Alps. In many of these regions a subtle balance was struck between tourism and agriculture, with positive benefits for both. However, these sectors are endangered by supra-regional and global trends in international tourism and agricultural policy (Messerli and Wiesmann, 1996; Wiesmann, 1999).



Fig. 5

Tourism has partly counterbalanced the marginalisation of mountain agriculture in the last two centuries, but its potential and stability in a globalised world should not be overestimated. (Grindelwald tourist resort; part of a restaurant table-mat produced by the Jungfrau railway company).

Photo: Urs Wiesmann, 2001

### 12.3 Tentative appraisal of core problems for the JACS Alps

Once again it must be noted that no regional workshop and pre-synthesis were carried out for the specific case of the JACS Alps. The following attempt in Table 2 to appraise core problems in non-sustainable development for the three sub-contexts outlined above is therefore not based on a transdisciplinary negotiation process (see Chapter 3), but is the tentative result of an initial approach based on literature and expertise. The objective is therefore not to make a sustainability appraisal for the JACS Alps but to relate conditions in the Alps to situations and appraisals in the other JACS regions.

This comparative focus is not based on selection and definition of a specific list of core problems in non-sustainable development in the Alps, but was undertaken with reference to the combined list of core problems that resulted from a synthesis of all regional workshops (see Chapter 13). The same ordinal scale used in other JACS workshops was applied to weight the severity of individual core problems per region, ranging from (1) = not relevant, to (7) = worst case in global comparison.

Table 2

Weighting of core problems by realm and sub-contexts.

Scientific realms	Core problems of non-sustainable development <sup>1</sup>	Sub-contexts in the highland-lowland syndrome context		
		Areas of concentration	Deserted areas	Recreational areas
Political & institutional	1. Weak international geopolitical position and negotiating power	2	4	2
	2. Dominant and conflicting world views and ethical values	2	5	3
	3. Contradictory policies and weak formal institutions at different levels	2	4	4
	4. Inadequate legal framework and regulations, lack of enforcement, lack of resources	4	2	3
	5. Erosion of traditional and/or indigenous institutions	4	5	4
	6. Failure of governance, insufficient empowerment and decentralisation	2	3	2
	7. Unequal distribution of power and resources, corruption	4	3	3

Table 2  
(continued)

Scientific realms	Core problems of non-sustainable development <sup>1</sup>	Sub-contexts in the highland-lowland syndrome context		
		Areas of concentration	Deserted areas	Recreational areas
Socio-cultural & economic	8. Social, cultural and ethnic tensions and insecurity	2	2	2
	9. Prevalence of crime, violence and conflict	1	1	1
	10. Unused or constrained innovative capacities and knowledge	2	3	2
	11. Great socio-economic and gender disparities	4	3	3
	12. Incompatible and fragile economic systems with limited market and employment opportunities	2	6	3
	13. Dominance of the global economy over national development	3	4	4
Population & livelihood	14. Constraints on human rights and on potential for individual development	2	3	2
	15. Poverty and insecurity of livelihoods	2	4	2
	16. Risk of disease and health vulnerability	2	2	2
	17. Population pressure and multi-dimensional migration	3	3	2
	18. Unfavourable dynamics and imbalances in socio-demographic structures	4	5	5
Infrastructure & land use	19. Poor water supply and environmental sanitation	3	3	2
	20. Lack of adequate infrastructure and management (transport, energy and irrigation)	2	4	2
	21. Limited and inadequate socio-economic services (education, health, markets)	2	4	2
	22. Discrimination with regard to information and communication flows and technology	2	4	2
	23. Inequity in ownership of land as well as access to land and natural and common property resources	3	2	3
	24. Inadequate and conflicting land use systems and technologies	4	2	3
Bio-physical & ecological	25. Shortages of freshwater	2	2	2
	26. Degradation of land, soil and vegetation cover	5	4	3
	27. Degradation of forest and natural habitats	4	3	3
	28. Pollution and overuse of renewable and non-renewable natural resources	5	2	3
	29. Loss of biological and agro-biological diversity	4	3	2
	30. Risk of natural and human-induced hazards and climate change	3	4	3

<sup>1</sup> Version compiled on the basis of the workshops held in the other eight JACS of the NCCR North-South (see Chapter 13)



This initial appraisal of core problems in non-sustainable development for three sub-contexts in the highland-lowland context of the Alps illustrates that problems of sustainability exist in these contexts, but that they are of much less severe immediacy than problems in most contexts addressed in other JACS regions. It is unclear whether this is a result of buffering measures, circumstances and policies at regional, national or international scales, or whether the list of core problems from the other JACS regions is inadequate to encompass the problems of sustainability faced in the JACS Alps. This will have to be evaluated in the further course of the NCCR North-South.

Comparing the three sub-contexts, we can state that the fewest sustainability problems are found in the sub-context of recreational areas – at least according to the problem list from the other JACS regions. It must be pointed out, however, that the dynamics and trends affecting this sub-context may endanger the subtle endogenous balance between tourism and agriculture, and therefore add to the problems of sustainability in future. In the sub-context of concentrated areas, sustainability problems in the realms of land use and ecology are the most severe, whereas the sub-context of deserted areas is facing a cluster of problems that touches all realms. The differences between the three sub-contexts can be interpreted as preliminary indications of syndromes or potential syndromes. These first indications will, however, require further evaluation.

## 12.4 Research status and focus

The JACS Alps can draw on the experience of 25 years of integrated and transdisciplinary research (Wiesmann, 2001) that incorporates detailed disciplinary studies in a broad range of fields and includes participatory transfer processes. This research also provides analyses and accounts of the various changes in alpine regions that have taken place during the past 200 years. This period was characterised by deep-rooted economic, social and political change and various exogenous driving forces. For example, the wealthy Swiss tourist resort of Grindelwald was once an impoverished and remote mountain village. The difference in income between inhabitants and tourists was at a ratio greater than 1 to 100 in the 19<sup>th</sup> century – similar to differences found nowadays in many tourist areas in developing countries. Research experience and results of this sort make it possible to develop indicators and hypotheses for analysis of NCCR North-South issues, concerned with when, how and under which circumstances inhabitants were empowered to guide development in their villages. This in turn makes it possible to discuss the successes and failures of various development approaches, strategies and paths, and provides a basis for mutual learning processes by means of exchange related to cases within the context of the NCCR North-South.

Against the background of this research and its potential to promote mutual learning processes within the overall programme, it becomes clear that the core research questions for the JACS Alps relate to the balance between endogenous and exogenous driving forces and the potential to foster sustainable development within the various sub-contexts. Recently the potential for a significant role for the JACS Alps in promoting research, debate and mutual learning processes on these questions within the overall NCCR North-South was greatly enhanced through a strong collaborative link with the newly established Jungfrau-Aletsch-Bietschhorn World Natural Heritage Site (JAB). This originally unforeseen opportunity offers scope for a concrete contribution to the development of integrated and transdisciplinary management of this World Heritage Site and its surrounding contexts. It also enhances the possibility to relate to a broad range of partners in Switzerland and enhance exchange and collaboration with partners from other JACS regions dealing with regional development and conservation.

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**Part III**  
**Synopsis and**  
**Outlook**





## **13 Synopsis of Syndrome Contexts and Core Problems Associated with Syndromes of Global Change**

Peter Messerli and Urs Wiesmann

### **Abstract**

The present chapter attempts to synthesise the outcomes of the eight JACS workshops described in the second part of this publication. Although the basis for comparison was somewhat limited owing to the methodological diversity of these workshops, a synthesis has been elaborated, using a four-step approach. First, the different syndrome contexts determined by the JACS workshops were contrasted with the original three syndrome contexts. This made it possible to determine which contexts are actually comparable. As a result, the highland-lowland context was divided into a “highland and mountain” context and a “highland-lowland interactions” context. Second, the synopsis of core problems of non-sustainable development mentioned in the different JACS workshops resulted in a modified list that reflects the diversity of issues raised by workshop participants. This was the result of adding new core problems, characterising others in terms of more specific aspects, and restating existing core problems. Third, the newly compiled list made it possible to compare the weightings assigned to problems in specific syndrome contexts. The most severe and least severe problems were identified, and combinations of problems described by several JACS workshops simultaneously were revealed and characterised as patterns. These patterns allow for hypotheses on syndromes of global change, as they appear to be based on typical clusters of problems that occur in several parts of the world in specific contexts. This leads to a description of potential syndromes in the “highland and mountain” context and the “urban and peri-urban” context, each being characterised by four patterns. Only two patterns were identified for a potential syndrome in the “highland-lowland interactions” context. The



weak basis for comparison of results did not make it possible to describe a potential syndrome in the “semi-arid” context. Fourth and finally, on average it appears that the syndromes in the “highland-lowland interactions” context are the most acute syndromes of global change, followed by the syndromes in the “urban and peri-urban” and “highland and mountain” contexts. Moreover, “governance failures and insufficient empowerment”, “fragile economic systems” and “lack of adequate infrastructure” were determined to be among the most severe core problems. The present synthesis and the preliminary hypotheses on syndromes of global change offer the possibility of defining a set of common research questions in each syndrome context. It is therefore proposed to intensify context-oriented research in order to significantly advance the integration of research within the entire NCCR North-South.

## 13.1 Introduction

### 13.1.1 Overall goal and approach

The preceding chapters containing eight pre-synthesis reports for the NCCR North-South JACS regions are characterised by great diversity of content and methodology. Although this productive and critical diversity is a major asset of the NCCR approach, we might wonder if it is still possible to compare the outcomes of the workshops in terms of their integration within the overall framework of the NCCR programme. Thus we may ask:

- Are the syndrome contexts identified by the eight regional workshops still comparable to the original three syndrome contexts defined by the programme, and thus comparable to each other?
- Can we synthesise the numerous and diverse core problems of non-sustainable development identified by the different think tanks in each workshop in order to create a new overall list of core problems reflecting this diversity?
- With reference to the regional workshops where participants were asked to weight the core problems of non-sustainable development for each syndrome context according to their relevance at the global scale: what are the most serious core problems in each syndrome context, and do certain core problems receive similar weightings throughout the different JACS? In other words, can contexts be characterised by clusters of specific core problems of non-sustainable development, as hypothesised in Chapter 3?
- If certain relevant core problems appear simultaneously in one JACS, does the same combination of problems appear in other JACS? In other words, can patterns of specific combinations of core problems be observed in each context?

These questions reveal that synopsis and synthesis are of great interest and crucial importance to the entire programme, despite the uniqueness of each region. The overall goal of the present chapter is therefore to make a synoptic comparison of the results for the different syndrome contexts reported by the eight regional workshops. It must be recalled that no regional workshop and pre-synthesis report was foreseen for the JACS Alps, given its special subor-

dinate position in the programme. The report presented in Chapter 12 was thus not taken into account.

The synopsis and synthesis of the eight pre-synthesis reports implies a careful analysis of the workshop results based on a four-step approach:

(i) *Synopsis of syndrome contexts:*

The first step is an attempt to determine how the original syndrome contexts (i.e. “highland-lowland”, “urban and peri-urban” and “semi-arid”) were addressed in the regional workshops, whether they were maintained or further divided into sub-contexts, and whether contexts are still comparable.

(ii) *Synopsis and synthesis of core problems of non-sustainable development:*

The aim of the second step is to find out whether the core problems enumerated are comparable among different JACS. In other words, we will attempt to define congruencies without neglecting differentiations and innovative elements. The original list of core problems established during the conceptual workshop in Montézillon, Switzerland (see Chapter 3, Table 1, p. 51) will serve as a guideline.

(iii) *Weighting and combinations of core problems of non-sustainable development in different syndrome contexts:*

The third step is to link the syndrome contexts with the weightings assigned to core problems of non-sustainable development. We will thus look at specific syndrome contexts in different JACS to find out which core problems are considered severe. This step will provide two kinds of information: first, we will see the weighting assigned to each core problem by the different JACS, which will make it possible to compare different core problems in the syndrome contexts. Second, we may be able to determine whether a certain combination of relevant core problems in one JACS can also be observed in other JACS. This could eventually allow hypotheses about patterns formed by combinations of problems typical of specific syndrome contexts.

(iv) *Acuteness of syndromes and overall severity of core problems:*

Finally, a list of all aggregated syndrome contexts will give an overview of the overall relevance of core problems of non-sustainable development. It will further allow for a ranking of problems of global change in

the respective areas of examination. At the same time, it should reveal the differences between the JACS regions.

This four-step approach aims to provide answers to the questions posed above. It will hopefully contribute to fruitful discussions on syndromes and the syndrome approach, thereby strengthening integration within the NCCR North-South as a whole.

### **13.1.2 General methodological comments**

As outlined in Chapter 3, the original methodology proposed for the eight regional workshops was modified considerably during application. Based on the major changes already stated in Chapter 3 and our own analysis of the results, the following methodological differences were encountered:

- Specific composition of the think tanks determining the selection and weighting of core problems;
- Addition of foci to the pre-synthesis approach, such as consideration of potentials and opportunities;
- Substantial modification of the originally proposed three syndrome contexts and proposal of new contexts;
- Different modes of weighting core problems (relevance at global scale, relevance for JACS region, relevance for IP topic, etc.) or elimination of this step;
- Differences between the list of core problems established for the syndrome contexts and the overall consolidated list of core problems for the JACS;
- Modification of the labels of the scientific realms in the original list, leading to elimination or addition of issues that had not been considered by other think tanks;
- Great variation in the number of core problems identified (from 17 to 52).

Although these modifications in methodology allowed for productive and critical diversity, they raise the methodological question of comparability. We dealt with this problem in the following ways: first, we often had to reduce our comparative analysis to the smallest common denominator, i.e. to a selection of JACS that could be compared. Second, interpreting complementary data in the texts sometimes enlarged this strict methodological restriction. Third, we believe that comparative analysis – even when all JACS are not included – still yields interesting data. It allows formulation of hypotheses that may be disproved at a later stage in the JACS regions. As the methodological constraints vary from step to step in our approach, we have inserted brief methodological comments where necessary in the following sections.

## **13.2 Synopsis of syndrome contexts**

### **13.2.1 Overview of syndrome contexts**

Based mainly on political considerations and the competence of involved partner institutions, the NCCR North-South selected three major contexts in which syndrome mitigation research would be concentrated: the “semi-arid”, the “highland-lowland” and the “urban and peri-urban” contexts. These broad societal, economic, political and ecological contexts have not been defined as analytical categories. Rather, it is expected that one or several syndromes might be identified in each of these contexts. The first step in the regional workshops was therefore to describe specific contexts for each JACS region and determine whether sub-contexts had to be defined. This process should be the result of transdisciplinary negotiation on urgency and competence in addressing the respective contexts (see Chapter 3, section 4).

Table 1 gives an overview of all contexts and sub-contexts described by the think tanks in the different JACS workshops. The shaded areas represent the delimitations of the three original syndrome contexts. This shows the degree to which the newly defined contexts and sub-contexts coincide with the original contexts or, more problematically, cover more than one context at the same time. In addition, the white fields show areas where the corresponding contexts have not been considered, either because they were omitted or because they do not exist in the corresponding JACS.

Syndrome contexts	West Africa	East Africa	Horn of Africa	Central Asia	South Asia	South East Asia	Central America and the Caribbean	South America	Modified list of syndrome contexts
<b>Urban and peri-urban</b>	Urban and peri-urban areas (large and medium-sized cities)	Urban and peri-urban areas (large and medium-sized cities)	Urbanisation	-	-	Urban and peri-urban	Urban and peri-urban	Urban and peri-urban	Urban and peri-urban
	Mountains and highlands with a broad range of conflicting uses and stakeholders	Highlands: a) Drought-prone, low-potential b) Highly degraded, low-potential c) Highly degraded, high-potential d) Susceptible to degradation, high-potential	Intermediate (foothills and lowland zones and urbanised areas)	a) Marginality in mountain areas in relation to lowlands b) Indigenous people in mountain areas in relation to lowlands c) Fragility in mountain areas in relation to lowlands	Urban and peri-urban	Highland	Highland-lowland interactions: i.e. Highland (rural) – lowland (urban) interactions	Highland	Mountain and highland
<b>Highland-lowland</b>	Areas of interaction between mainly productive highlands and semi-arid lowlands	Highland-lowland interactions	Humid lowlands	Mountains		Highland		Highland-lowland interactions	Highland-lowland interactions
	Semi-arid: mixed use, irrigation and great economic and political disparities	Semi-arid: mixed use, irrigation and great economic and political disparities	Semi-humid and semi-arid lowlands in transition	Semi-arid (including highland-lowland interactions)		Highland-lowland interactions		Lowland	Highland-lowland interactions
<b>Semi-arid</b>	Encroaching agro-pastoral use by marginalised smallholders	Pastoralist lowlands							
	Predominantly pastoral use in the economic and political periphery								
	Including protected areas and their surroundings								
									Semi-arid

Table 1: Overview of contexts and sub-contexts defined during the eight regional JACS workshops (on the left: the original three NCCR North-South syndrome contexts).

### **13.2.2 The “urban and peri-urban” context**

For the “urban and peri-urban” context there was great congruence throughout the different JACS. On the one hand there seems to be no need to define sub-contexts. On the other hand, there is a general consensus that this context must be addressed. However, the JACS Central Asia and JACS South Asia are important exceptions. Although they mentioned the urban context within their regional workshops, they did not address it explicitly but rather as one aspect of the “intermediate” context in Central Asia and as a “highland-lowland” syndrome context in South Asia. Unfortunately, this makes comparison with other JACS almost impossible.

### **13.2.3 The “highland-lowland” context**

In the “highland-lowland” context there is a considerable need for further differentiation in all JACS except Central America and the Caribbean. Generally speaking, this differentiation is made in terms of two major sub-contexts: the “highland and mountain” and the “highland-lowland interactions” sub-contexts. In two JACS (Horn of Africa and South America) an additional distinction was made for “lowlands”.

The aspect of interaction was at the centre of considerations in the “highland-lowland interactions” sub-context. Highland-lowland interactions were frequently overlaid by additional characteristics, such as rural-urban, productive-less productive, humid-arid or arid-humid, which should be taken into consideration when comparing interactions between highlands and lowlands in different JACS.

The remaining sub-contexts can be characterised as differentiations of “highland and mountain”, with the exception of the JACS South Asia. Because in this JACS a choice was made for a strong thematic focus on marginality, indigenous people and fragility in relation to lowlands, direct comparison is difficult for both sub-contexts.

### **13.2.4 The “semi-arid” context**

In the “semi-arid” context, further distinctions were made in East Africa and the Horn of Africa. In Central Asia, the aspect of interaction with highlands was underlined. The sub-contexts mentioned fit quite well with the overall syndrome context, and there appears to be no need for further differentia-

tion. Despite this great congruence, it seems noteworthy that only four out of eight JACS considered the “semi-arid” context, and that three of these are located in Africa. On other continents this context either does not occur or is not explicitly addressed (South Asia, Central America and the Caribbean, South America).

### **13.2.5 Conclusions on syndrome contexts**

In conclusion, we can state that the “urban and peri-urban” and the “semi-arid” contexts show great congruence. Although urban and peri-urban areas occur in all JACS, only six JACS are comparable, as these contexts were not addressed in two cases. “Semi-arid” contexts were only addressed in four JACS, of which three are located in Africa. With regard to the “highland-lowland” context, we suggest further division into a “highland and mountain” sub-context and a “highland-lowland interactions” sub-context, as these two contexts are clearly distinct in terms of societal, economic, political and ecological aspects. Comparability for the “highland and mountain” context is possible in six of the eight JACS, although certain limitations may be encountered for South Asia, while five of the eight JACS addressed “highland-lowland interactions”. For the latter, comparison should be made with caution, as the think tanks often highlighted specific characteristics of highland-lowland interactions such as rural-urban, humid-arid, etc.

## **13.3 Synopsis and synthesis of core problems of non-sustainable development**

### **13.3.1 Procedure and methodology**

During each JACS workshop, two lists of core problems were established. One is a list of the problems that occur in specific contexts or sub-contexts, the other a consolidated list of core problems relevant to the entire JACS. To obtain a synopsis of the consolidated lists, we initially classified all core problems according to the scientific realm they address and the JACS where they were identified. This classification was then further refined by trying to identify similar core problems in all the JACS, as well as problems that can be considered specific aspects of a more general problem. For this task, guidance was provided by the original list of core problems established during the Montézillon workshop (see Chapter 3, Table 1, p. 51). In other words, we linked each core problem mentioned in a JACS workshop to a core prob-



lem from the Montézillon list. This implies that certain core problems were shifted to another scientific realm. Three phenomena were observed in this process: 1) convergence, where problems generally match well, although certain specific aspects should not be forgotten; 2) divergence, where new aspects of core problems appear, thus calling for further differentiation among core problems; and 3) innovations, comprising aspects not previously considered and which cannot be subsumed in other core problems. We were then able to reformulate the overall list of core problems from Montézillon as a new, synthesised list of core problems (see Table 2, p. 397). This list reflects the diversity of core problems identified during the eight regional workshops.

Methodologically, the following challenges constrained the procedure described above:

- Great variation in the number of core problems selected for each JACS, i.e. the different degree of aggregation or differentiation. A selection of the most important problems had to be made for JACS with a very high number of core problems (based on the weighting established during the workshops). For JACS with only a few core problems that had several aspects, distinctions were sometimes made.
- Selection of core problems with respect to the main IP research themes: In some JACS it was obvious that the selection of core problems was not made with reference to sustainable development in general but with regard to the main research focus of the IP involved. Whenever possible, we tried to include such problems as specific aspects of more general core problems. However, problems that were too specific and thus incompatible with the list had to be excluded.

### **13.3.2 Synopsis of core problems in the political and institutional realm**

Generally speaking, the eight regional workshops identified many severe core problems within the political and institutional realm. This led to a relatively high degree of differentiation by comparison with the initial list formulated in Montézillon.

With regard to the core problem of “inadequate institutions”, the regional think tanks first distinguished formal institutions from traditional and

indigenous institutions, whose continuous erosion was considered to be a severe problem. Furthermore, inadequate legal frameworks and regulations, lack of their enforcement and lack of corresponding means were mentioned as other important aspects of “inadequate institutions”. With regard to weak formal institutions, it is important to note that they must be considered at different levels, from local communities to national and even international scales. There is also a serious problem of coordination among them. The difficulties of coordination between different levels and among various sectors are also important in relation to “contradictory and inadequate policies”. Not only does lack of coordination lead to contradiction and conflicts, but the policies also fail to respond to social demands. These inadequacies were strongly underlined during determination of the different aspects of “governance failures and insufficient empowerment of actors”. Apparently, the different regional think tanks seem to agree that one important aspect of governance failure is denial of self-determination – exclusion from political participation and decision-making – leading, among other things, to inactive citizenship. The dilemma between centralisation and decentralisation is closely related to this problem.

Other core problems in this scientific realm, such as “unequal distribution of power and resources”, where the only addition was corruption, and “dominating and conflicting world views and ethical values”, are characterised by great congruence throughout the JACS. One important innovation can be reported with regard to the Montézillon core problem lists: the weak international geopolitical position and negotiating power of regions and countries was mentioned by at least four JACS. This problem was characterised by a lack of inter-state mechanisms to deal with cross-border issues, regional geopolitical instability, and political and/or economic dependence on super-powers such as the USA.

### **13.3.3 Synopsis of core problems in the socio-cultural and economic realm**

In the socio-cultural and economic realm, two core problems, “social and ethnic tensions” and “violent conflicts”, were largely confirmed by the regional workshops. This is particularly true for differentiation between situations of tension and insecurity and outbreaks of violence. It is important to note that the core problem of “violent conflicts” includes outbreaks at different levels, from the individual (violence) to groups (crime), leading up to violent conflicts, possibly at the national or even international levels.

Regarding the core problem of “unused potentials for innovative capacities”, an interesting dichotomy can be identified between constraints which may result from cultural norms and practices on the one hand, and the loss of indigenous knowledge on the other hand. Furthermore, the important issue of the flight of human capital – also known as “brain drain” – was brought up. Economic problems can also hinder education and training efforts when young people are forced to interrupt their education to find a job.

The core problem of “great social and economic disparities” was largely confirmed by the regional workshops. Gender disparities and inequality are a major aspect of this problem and were mentioned in almost all JACS.

Next, the entire domain of economic problems was analysed and compared. Starting with the general problem statement of “incompatible and fragile economic systems”, a great variety of sub-problems were mentioned and repeatedly confirmed. An initial important differentiation was made between the formal and informal sectors of the local economies, and resulting conflicts and incompatibilities were underlined. These problems are further associated with issues such as limited market and employment opportunities, problems of privatisation, and unappealing settings for investment. A further important economic problem arises from the “dominance of the existing global economy”, which hinders the development of national economies, either because of global regulations or because national economies are not competitive in a global context.

#### **13.3.4 Synopsis of core problems in the population and livelihood realm**

Comparison of core problems between different JACS reveals good congruence for “constraints on human rights and individual development potential”. Great congruence can also be observed for “health risks and vulnerability to ill health” – a core problem mentioned by all eight JACS.

The core problem of “poverty and insecurity of livelihood” was further refined in urban contexts to encompass exclusion and social fragmentation associated with problems of unemployment, drug addiction, prostitution, etc. The key term “social depression” was also raised. In rural settings, the dominance of subsistence production and limited alternative livelihood systems were highlighted; these problems lead to high socio-economic vulnerability.

With regard to “population pressure and migration”, the need for differentiation into the sub-categories of “population pressure and multi-dimensional migration” and “unfavourable dynamics and imbalances in socio-demographic structures” has already been noted above.

### **13.3.5 Synopsis of core problems in the infrastructure, services and land use realm**

In the scientific realm of infrastructure, services and land use, some important specifications and innovations can be observed. The core problem of “lack of adequate infrastructure”, including general aspects such as roads, supply of electric energy, etc., was further differentiated in terms of primarily urban aspects (housing, city infrastructure) and more rural aspects (transportation, irrigation). Several regional workshop think tanks also pointed out that management and maintenance of infrastructure is just as great a problem as installation of infrastructure.

With regard to the core problem of “access to land and natural resources”, two important additions can be made: first, the problem of access is often a problem of ownership, i.e. inequitable land tenure systems, growing privatisation, etc. Second, land and natural resources should be complemented by common property resources, apparently a key issue in several JACS.

Besides these modifications of already existing core problems, three new topics were raised, which were later restated as new core problems. The first topic concerns land use. The regional workshops demonstrated that the problem must be explicitly addressed. This was not the case in the Montézillon list. Land use problems comprise many different aspects, ranging from non-optimal productivity levels and inappropriate technologies to conflicting interests and environmental externalities. The second topic concerns socio-economic services. An impressive array of severe problems were mentioned, consisting of more general aspects as well as specific needs, including the lack of very specific services such as education, extension services, health services, markets and credits, etc. A further issue raised by the think tanks in the regional workshops was access to information and communication flows. As six out of eight JACS explicitly complained in one form or another about discrimination related to information and communication flows, as well as access to technologies, we presume this should be addressed as a separate core problem.

### **13.3.6 Synopsis of core problems in the bio-physical and ecological realm**

Generally speaking, the Montézillon list covered core problems in the bio-physical and ecological scientific realm quite well. Problems such as inadequate availability of freshwater or loss of biological diversity were largely confirmed. Nevertheless, the differentiations made by the think tanks in the eight workshops showed that the divisions did not really correspond to the needs of the JACS. First, land degradation was further refined into degradation of land, soil and vegetation cover; the problem of degradation of forests and other natural habitats was amended as a separate issue. Second, the proposed distinction between renewable and non-renewable resources faded in the JACS workshop lists, as these resources are equally threatened by pollution and overuse. Finally, the core problem of “risks of natural hazards and climate change” was complemented by “human-induced hazards”.

### **13.3.7 Proposal of a modified list of core problems**

As mentioned earlier in this chapter, observations and comparisons of the different lists produced some congruencies, some divergence and some interesting innovations. We therefore tried to modify the core problem list originally proposed in the Montézillon workshop by restating, differentiating, merging and adding core problems, thereby producing a new list of core problems (Table 2). This new list should more appropriately reflect the evaluations made in the eight regional workshops.

Table 2

Scientific realms	Core problems of non-sustainable development	
	List of potential core problems compiled in Montézillon	List of core problems compiled by think tanks in eight regional JACS workshops
Political & institutional		1 Weak international geopolitical position and negotiation power
	1 Dominating and conflicting world views and ethical values	2 Dominating and conflicting world views and ethical values
	2 Contradictory and inadequate policies	3 Contradictory policies and weak formal institutions at different levels
	3 Inadequate institutions	4 Inadequate legal framework and regulations, lack of enforcement and means
		5 Erosion of traditional and/or indigenous institutions
	4 Governance failures and insufficient empowerment of actors	6 Governance failures, insufficient empowerment and decentralisation
	5 Unequal distribution of power and resources	7 Unequal distribution of power and resources, corruption
Socio-cultural & economic	6 Social and ethnic tensions	8 Social, cultural and ethnic tensions and insecurity
	7 Violent conflicts	9 Prevalence of crime, violence and violent conflicts
	8 Unused potential of innovative capacities and existing knowledge	10 Unused or restricted innovative capacities and knowledge
	9 Great socio-economic disparities	11 Great socio-economic and gender disparities
	10 Incompatible and fragile economic systems	12 Incompatible and fragile economic systems with limited market and employment opportunities
	11 Dominance of the existing global economy	13 Dominance of the global economy over national development
Population & livelihood	12 Restrictions on human rights and individual development potential	14 Restrictions on human rights and individual development potential
	13 Poverty and livelihood insecurity	15 Poverty and livelihood insecurity
	14 Health risks and vulnerability to ill health	16 Health risks and vulnerability to ill health
	15 Population pressure and migration	17 Population pressure and multi-dimensional migration
		18 Unfavourable dynamics and imbalances in socio-demographic structures

Comparison of the list of potential core problems formulated in Montézillon and the list of core problems of non-sustainable development compiled by think tanks in eight regional JACS workshops.

(continued p. 398)

Table 2  
(continued)

Scientific realms	Core problems of non-sustainable development	
	List of potential core problems compiled in Montézillon	List of core problems compiled by think tanks in eight regional JACS workshops
Infrastructure, services & land use	16 Poor water supply and environmental sanitation	19 Poor water supply and environmental sanitation
	17 Lack of adequate infrastructure (including energy supply)	20 Lack of adequate infrastructure and management such as transport, energy and irrigation
		21 Limited and inadequate socio-economic services such as education, health and markets
		22 Discrimination in information and communication flows and technologies
	18 Problems of access to land and natural resources	23 Inequality of ownership and access to land, natural and common property resources
		24 Inadequate and conflicting land use systems and technologies
Bio-physical & ecological	19 Inadequate availability of freshwater	25 Inadequate availability of freshwater
	20 Land degradation	26 Degradation of land, soil and vegetation cover
		27 Degradation of forests and other natural habitats
	21 Pollution and overuse of renewable natural resources	28 Pollution and overuse of renewable and non-renewable natural resources
	22 Loss of biological diversity	29 Loss of biological and agro-biological diversity
	23 Risks of natural hazards and climate change	30 Risks of natural and human-induced hazards and climate change
	24 Depletion of non-renewable natural resources	

## 13.4 Weighting of core problems in syndrome contexts and preliminary hypotheses on patterns

### 13.4.1 Procedure and methodological constraints

As argued earlier in this chapter, we propose to examine the new, synthesised list of core problems (Table 2) with reference to four rather than three syndrome contexts, since it is necessary to distinguish between the “highland and mountain” and the “highland-lowland interactions” contexts. The main point of looking at the syndrome contexts is to find out which core problems are considered the most acute in each context and whether “typical” combinations of core problems are found in each context. To this end we compared the different weightings of core problems occurring in the four syndrome contexts. In order to ensure a basis of comparison we proceeded as follows:

- Assigning of weightings to core problems: if a core problem listed by the JACS workshop was the same as one in the compiled list, the weighting was transferred as is. If two or more problems in the JACS list were aspects of only one core problem in the compiled list, the mean weighting of the two or more aspects was calculated and transferred.
- Standardisation of weightings by assigning a value from 0 to 3, with 0 = core problem not considered; 0.1 – 1 = not very acute core problem; 1.1 – 2 = acute core problem; 2.1 – 3 = very acute core problem. It may seem problematic to attribute the value 0 to a core problem that was not addressed, thus reducing the average score; still, if experts decide not to address a core problem, this seems to indicate that such a problem is not relevant within the region.

All weightings were then shown in a synoptic list, making it possible to calculate the mean acuteness of each problem by context. On the other hand, the overview of the different weightings revealed that certain combinations of core problems were repeated in other JACS. In other words, we tried to locate combinations of core problems that appeared not only in one JACS at a time but in the majority of JACS. These repeated combinations were then called “patterns”.



Various problems arose as a result of variations in the methodologies applied in the eight regional JACS workshops, making the procedure a difficult one. These problems were:

- In certain JACS, weighting of core problems was not done for the entire JACS. The contexts described could not be used for comparison (Central America and the Caribbean, South Asia and partly South America).
- In other JACS, the list of core problems for the contexts was different from the overall list valid for all JACS. In this case, the weighting could not be considered (Central Asia).

These difficulties further reduced the number of comparable contexts. These were reduced in number as follows: for the “highland and mountain” context, six were reduced to four; in the “highland-lowland interactions” context only three of five contexts were comparable; in the “semi-arid” context, three of five remained; and in the “urban and peri-urban” context four of six remained.

#### **13.4.2 The “highland-lowland interactions” sub-context**

An overview of weightings assigned to different core problems in three JACS is presented in Table 3 (p. 402). Comparison of the weightings established by the regional think tanks in the JACS shows that the JACS East Africa generally chose higher values than the other JACS, i.e. it judged all problems to be generally more acute. It is not possible to determine at this stage whether a different set of criteria was applied or whether the problems are actually more acute. Further observations can also be made. Problems in the political and institutional realm generally received very high scores in the JACS Horn of Africa. Different problems were considered acute in the context of highland-lowland interactions: in the Horn of Africa these included “weak international geopolitical position and negotiation power”, and in East Africa “prevalence of crime, violence and violent conflicts”. It is also interesting to see that many problems in the bio-physical and ecological realm were considered less important in the highland-lowland interactions context in the Horn of Africa.

The average scores obtained by the specific core problems in the three different JACS show that political and institutional problems were regarded as

playing a predominant role in highland-lowland interactions (scores  $\geq 2.0$ ): “contradictory policies and weak formal institutions at different levels” as well as “governance failures and insufficient empowerment and decentralisation” are at the top of the list, followed by “erosion of traditional and/or indigenous institutions”. Other major problems in this syndrome context are “social, cultural and ethnic tensions and insecurity” and “poverty and livelihood insecurity”. Interestingly, “population pressure and migration” were considered less acute than “unfavourable dynamics and imbalances in socio-demographic structures”, and “inadequate land use systems” less important than “inequality of ownership and access to land and resources”.

The next step is to look at combinations of core problems appearing simultaneously. Of course, such combinations within one JACS are innumerable, but our perspective was different. We looked for combinations of important core problems that occur not only in one JACS but simultaneously in all three JACS. A combination of core problems that is the same in all three JACS constitutes a “pattern” of core problems. The final column in Table 3 indicates where such potential patterns exist: all core problems named in all three JACS considered acute (score  $\geq 1.5$ ) were marked with the letter [a]. This resulted in a combination of four core problems shown in the inner circle in Figure 1. If less acute core problems (score  $\geq 1.0$ ) are also taken into account, the combination of core problems is supplemented by five additional core problems marked with the letter [b] and shown in the outer circle in Figure 1.

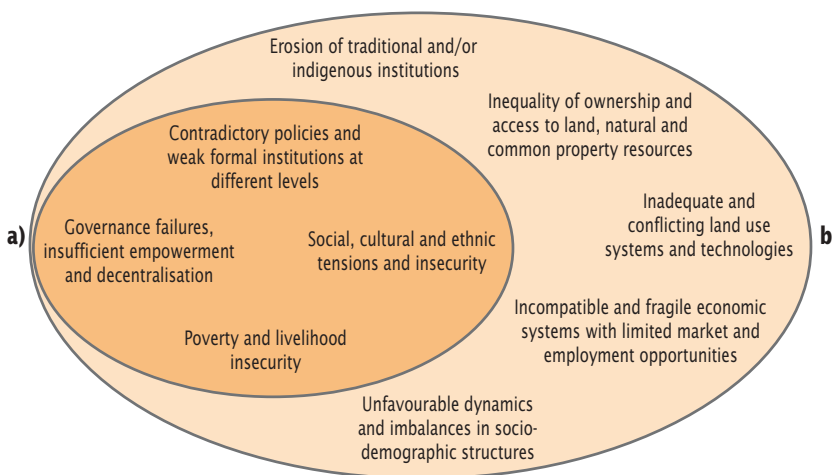


Fig. 1  
Two sets of acute and less acute core problems occurring in all three JACS within the “highland-lowland interactions” sub-context, indicating a pattern and thus a potential syndrome in the “highland-lowland interactions” context.

Table 3

Weighted core problems of non-sustainable development for the “highland-low-land interactions” context. Average score per core problem and patterns of core problems:  
a) repetition of combinations in all three JACS with weightings  $\geq 1.5$ ;  
b) repetition of combinations in all three JACS with weightings  $\geq 1.0$ .

Scientific realms	No.	Core problems: revised list	Horn of Africa	East Africa	South East Asia	Average score	Combinations that form patterns
Political & institutional	1	Weak international geopolitical position and negotiation power	3	0	0	1	
	2	Dominating and conflicting world views and ethical values	3	1	0	1.3	
	3	Contradictory policies and weak formal institutions at different levels	3	2	3	2.7	a
	4	Inadequate legal framework and regulations, lack of enforcement and means	0	0	2	0.7	
	5	Erosion of traditional and/or indigenous institutions	3	3	1	2.3	b
	6	Governance failures, insufficient empowerment and decentralisation	3	3	1.6	2.5	a
	7	Unequal distribution of power and resources, corruption	2	2	0	1.3	
Socio-cultural & economic	8	Social, cultural and ethnic tensions and insecurity	3	2	2	2.3	a
	9	Prevalence of crime, violence and violent conflicts	0	3	0.5	1.2	
	10	Unused or restricted innovative capacities and knowledge	0	2	0	0.7	
	11	Great socio-economic and gender disparities	3	2	0	1.7	
	12	Incompatible and fragile economic systems with limited market and employment opportunities	1	2	2	1.7	b
	13	Dominance of the global economy over national development	3	1	0	1.3	
Population & livelihood	14	Restrictions on human rights and individual development potential	0	2	0	0.7	
	15	Poverty and livelihood insecurity	2	2	3	2.3	a
	16	Health risks and vulnerability to ill health	0	2	1	1	
	17	Population pressure and multi-dimensional migration	0	3	0.3	1.1	
	18	Unfavourable dynamics and imbalances in socio-demographic structures	3	3	1	2.3	b

Table 3  
(continued)

Scientific realms	No.	Core problems: revised list	Horn of Africa	East Africa	South East Asia	Average score	Combinations that form patterns
Infrastructure, services & land use	19	Poor water supply and environmental sanitation	0	2	0	0.7	
	20	Lack of adequate infrastructure and management such as transport, energy and irrigation	0	2	0.7	0.9	
	21	Limited and inadequate socio-economic services such as education, health, markets	2	2	0.7	1.6	
	22	Discrimination in information and communication flows and technologies	0	0	0	0	
	23	Inequality of ownership and access to land, natural and common property resources	3	2	1.3	2.1	b
	24	Inadequate and conflicting land use systems and technologies	1.7	2	1	1.6	b
Bio-physical & ecological	25	Inadequate availability of freshwater	0	3	2	1.7	
	26	Degradation of land, soil and vegetation cover	0	3	1.5	1.5	
	27	Degradation of forests and other natural habitats	0	3	1	1.3	
	28	Pollution and overuse of renewable and non-renewable natural resources	0	2	0	0.7	
	29	Loss of biological and agro-biological diversity	0	3	2	1.7	
	30	Risks of natural and human-induced hazards and climate change	2	2	0	1.3	

Very acute: > 2       Not very acute: ≤1 and > 0  
 Acute: ≤ 2 and > 1       Not acute: 0

Although the number of JACS serving as a basis for comparison is quite small and the methodological constraints are numerous, we can now hypothesise a syndrome in the “highland-lowland interactions” context consisting of a combination of five core problems, as shown in Figure 1. Moreover, if problems considered less acute in certain regions are also taken into account, an additional set of five core problems can be added. One could ask whether this is pure coincidence or whether it reflects a typical combination of core problems for the “highland-lowland interactions” context. It is too soon to answer this question. As mentioned above, such indications are hypotheses that need to be tested by studying problems and understanding underlying processes as well as possible interrelations. A syndrome in the “highland-lowland interactions” context can be said to exist only if the hypothesis is not falsified.

#### **13.4.3 The “highland and mountain” sub-context**

The overview of the weighted core problems in the “highland and mountain” context is given in Table 4 (p. 406). At first glance, no significant differences can be observed between the weightings established in the four JACS. In other words, we have neither an explicit reason to believe that the highlands and mountains in a certain JACS are completely different from region to region, nor that the methodology applied has a completely different logic. One can merely notice that within the JACS East Africa, the values assigned are again generally higher, and more weighting is given to the bio-physical and ecological realm, whereas the other JACS assigned greater importance to the political and institutional realm.

Focusing on the average scores, we can quickly see which problems are considered most acute in highlands and mountains in all four JACS (average weighting  $\geq 2.0$ ). “Poverty and livelihood insecurity” was weighted the most dominant core problem. It was followed by problems in other scientific realms: “governance failures, insufficient empowerment and decentralisation” and “unequal distribution of power and resources, corruption” in the political and institutional realm; “inequality of ownership and access to land” and “lack of adequate infrastructure” in the scientific realm of infrastructure, services and land use; and finally “degradation of land” and “degradation of forests and other natural habitats” in the bio-physical and ecological realm. Among the problems considered least acute in the “highland and mountain” context were: “dominance of the global economy over

national development”, “constraints on human rights and individual development potential”, “poor water supply and environmental sanitation”, “discrimination in information and communication” and “pollution and overuse of natural resources”.

In interpreting this general picture, we see that the prevalence of poverty and livelihood insecurity correlates with the degradation of land and forests. Interestingly, the next most important problems are not linked to “land use systems and technologies” but to questions of “ownership and access to land and resources”, questions of “governance and decentralisation” and “distribution of power”. Furthermore, the problem of infrastructure such as transport, roads, markets, etc. also appears to be very important. Among the least acute problems, some appear to be of little relevance, such as pollution of resources or water supply. On the other hand, there are also problems such as marginalisation in relation to the global economy, or discrimination with regard to information and communication flows, for which the weighting depends to a great extent on the perspective and evaluation criteria applied. These problems may not be perceived as being of overwhelming importance within the context itself or by the society concerned. Nevertheless, they must be considered as important root causes of other problems occurring within highlands and mountains.

Having gained an overview of problems in the “highland and mountain” syndrome context, we can turn our attention again to combinations of core problems that occur simultaneously in all JACS. As we can see in the final column of Table 4, the number of these combinations has increased from two to four ([a] – [d]) when compared to the “highland-lowland interactions” context. The reasons for this increase are that we have four rather than three JACS as a basis of comparison, and secondly, that we also accept a repetition of combinations in three of four JACS as a pattern. Correspondingly, only combination [a] is repeated in all four JACS, whereas combinations [b], [c] and [d] occur in three out of four JACS. Graphic depiction of these different combinations becomes more difficult, as many core problems are part of different combinations. Nevertheless, Figure 2 (p. 409) attempts to give a synopsis of the different combinations characterising the “highland and mountain” syndrome context.

Table 4

Weighted core problems of non-sustainable development for the “highland and mountain” sub-context. Average score per core problem and patterns of core problems:  
a) repetition of combinations in all four JACS (weighting always > 0);  
b) – d) repetition of combinations in three of four JACS (weighting always ≥ 1.5).

Scientific realms	No.	Core problems: revised list	South America	Horn of Africa	East Africa	South East Asia	Average score	Combinations that form patterns			
Political & institutional	1	Weak international geopolitical position and negotiation power	0	3	0	0	0.75				
	2	Dominating and conflicting world views and ethical values	0	0	2	0	0.5				
	3	Contradictory policies and weak formal institutions at different levels	0	2	2	1	1.3				
	4	Inadequate legal framework and regulations, lack of enforcement and means	2	0	0	1.5	0.9				
	5	Erosion of traditional and/or indigenous institutions	0	0	2	3	1.3				
	6	Governance failures, insufficient empowerment and decentralisation	2.5	0	3	2.7	2.1			c	
	7	Unequal distribution of power and resources, corruption	3	3	2	0	2				d
Socio-cultural & economic	8	Social, cultural and ethnic tensions and insecurity	3	0	1.5	3	1.9			c	
	9	Prevalence of crime, violence and violent conflicts	2	0	1.5	0.5	1				
	10	Unused or restricted innovative capacities and knowledge	1	2	1	0	1				
	11	Great socio-economic and gender disparities	0	0	2	2	1				
	12	Incompatible and fragile economic systems with limited market and employment opportunities	2	1	2	1	1.5	a			
Population & livelihood	13	Dominance of the global economy over national development	0	1	1	0	0.5				
	14	Restrictions on human rights and individual development potential	0	0	2	0	0.5				
	15	Poverty and livelihood insecurity	3	2	2	2	2.3	a	b	c	d
	16	Health risks and vulnerability to ill health	0	0	2	2	1				
	17	Population pressure and multi-dimensional migration	0	0	3	1	1				
	18	Unfavourable dynamics and imbalances in socio-demographic structures	0	0	3	0	0.8				

Table 4  
(continued)

Scientific realms	No.	Core problems: revised list	South America	Horn of Africa	East Africa	South East Asia	Average score	Combinations that form patterns			
Infrastructure, services & land use	19	Poor water supply and environmental sanitation	0	0	2	0	0.5				
	20	Lack of adequate infrastructure and management such as transport, energy and irrigation	2	2	2	2	2	a	b	c	d
	21	Limited and inadequate socio-economic services such as education, health, markets	0	0	2	1.7	0.9				
	22	Discrimination in information and communication flows and technologies	0	2	0	0	0.5				
	23	Inequality of ownership and access to land, natural and common property resources	1	2.5	3	1.7	2.1	a	b		
	24	Inadequate and conflicting land use systems and technologies	1	0.7	2	1	1.2	a			
Bio-physical & ecological	25	Inadequate availability of freshwater	0	1	1	1	0.8				
	26	Degradation of land, soil and vegetation cover	0.6	3	3	1.5	2	a	b		
	27	Degradation of forests and other natural habitats	2	1	3	2	2	a		c	d
	28	Pollution and overuse of renewable and non-renewable natural resources	0	0	2.5	0	0.6				
	29	Loss of biological and agro-biological diversity	0	2	3	2	1.8		b		
	30	Risks of natural and human-induced hazards and climate change	0	2	2	0	1				

<span style="display:inline-block; width:10px; height:10px; background-color:#f4a460; border:1px solid black;"></span> Very acute: > 2	<span style="display:inline-block; width:10px; height:10px; background-color:#f4c496; border:1px solid black;"></span> Not very acute: ≤1 and > 0
<span style="display:inline-block; width:10px; height:10px; background-color:#f4a460; border:1px solid black;"></span> Acute: ≤ 2 and > 1	<span style="display:inline-block; width:10px; height:10px; background-color:#fff; border:1px solid black;"></span> Not acute: 0



At the core of this problem cluster we find the problems of “poverty and livelihood insecurity” and “lack of adequate infrastructure and management”. These problems are involved in all four combinations. Together with three other problems involved in more than one combination (“degradation of forests and other natural habitats”, “degradation of land, soil and vegetation cover” and “inequality of ownership and access to land and resources”), they form the nucleus of the problems in the “highland and mountain” context. This basic consideration facilitates understanding of specific combinations, and we can now concentrate on the additional elements.

The above-mentioned cluster of core problems has specific characteristics if we look at combination [a], which has the two additional elements of “inadequate and conflicting land use systems” and “incompatible and fragile economic systems”. We should note that these two problems appear simultaneously, suggesting a potential correlation between them. The same correlation might be seen in combination [c] between “social, cultural and ethnic tensions” and “governance failures, insufficient empowerment and decentralisation”. Concerning combination [b], it is striking that there seems to be a closer relation between “loss of biological diversity” and issues such as “degradation of land” or “inequality of ownership and access to resources” than to “degradation of forests and other natural habitats”.

Of course, the above observations can still be expanded and require further discussion. Hypotheses as such should then guide further research in the “highland and mountain” syndrome context. As mentioned earlier, the hypotheses must be challenged by studying and understanding the underlying processes. Once these questions are verified, we will be able to describe a syndrome in the “highland and mountain” context, as suggested by Figure 2.

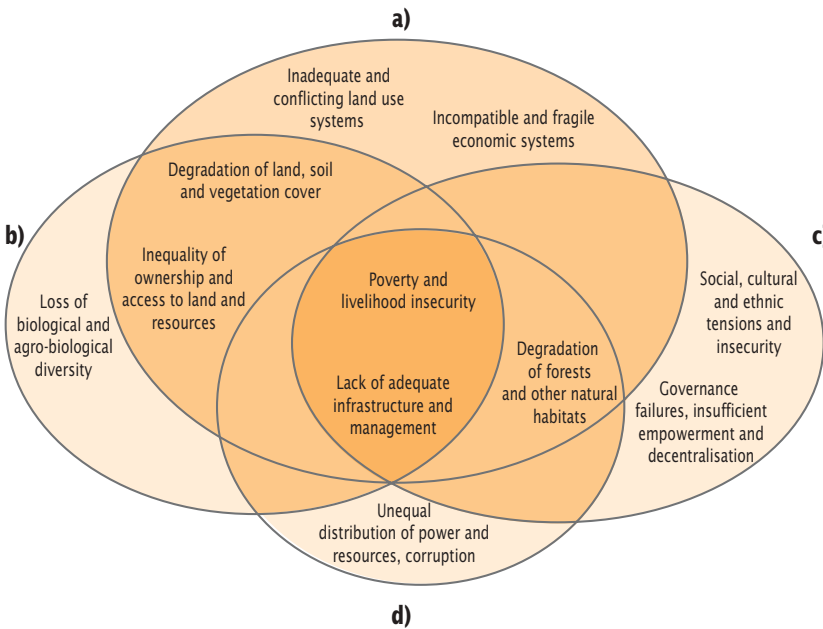


Fig. 2  
Four combinations of core problems within the "highland and mountain" syndrome context. As combination [a] occurs in all four JACS and combinations [b], [c] and [d] occur in three out of four JACS, they indicate possible patterns and thus a potential syndrome in the "highland and mountain" context.

#### 13.4.4 The "semi-arid" context

Examining the overview of weighted core problems in the "semi-arid" context (see Table 5, p. 410), we see that the highest scores were given to problems in the realm of infrastructure, namely "limited and inadequate socio-economic services" and "lack of adequate infrastructure and its management". These are followed by two problems in the socio-cultural realm, "great socio-economic and gender disparities" and "incompatible and fragile economic systems", where especially the conflicts between the traditional and modern economies were mentioned.

Yet if we observe the weightings assigned by the different regional workshops, we perceive major differences between the JACS West Africa and the two other JACS in East Africa and the Horn of Africa. Whereas the think tanks in the JACS East Africa and Horn of Africa generally rated the problems as being quite acute, giving a certain emphasis to the bio-physical and ecological realm, participants in the JACS West Africa workshop generally rated fewer core problems as being relevant. They identified no major problems in

Table 5

Weighted core problems of non-sustainable development for the “semi-arid” syndrome context, and average score per core problem.

Scientific realms	No.	Core problems: revised list	West Africa	Horn of Africa	East Africa	Average score
Political & institutional	1	Weak international geopolitical position and negotiation power	0	2	0	0.7
	2	Dominating and conflicting world views and ethical values	0	0	1	0.3
	3	Contradictory policies and weak formal institutions at different levels	0	2.5	2	1.5
	4	Inadequate legal framework and regulations, lack of enforcement and means	0	0	0	0
	5	Erosion of traditional and/or indigenous institutions	0	2	3	1.7
	6	Governance failures, insufficient empowerment and decentralisation	1	2	2	1.7
	7	Unequal distribution of power and resources, corruption	0	2	1.5	1.2
Socio-cultural & economic	8	Social, cultural and ethnic tensions and insecurity	0	2	2.5	1.5
	9	Prevalence of crime, violence and violent conflicts	0	2	2.5	1.5
	10	Unused or restricted innovative capacities and knowledge	0	0	1.5	0.5
	11	Great socio-economic and gender disparities	3	2	2	2.3
	12	Incompatible and fragile economic systems with limited market and employment opportunities	1.5	2	3	2.2
Population & livelihood	13	Dominance of the global economy over national development	0	0	2	0.7
	14	Restrictions on human rights and individual development potential	0	0	2	0.7
	15	Poverty and livelihood insecurity	0	2	2	1.3
	16	Health risks and vulnerability to ill health	2	2	3	2.3
	17	Population pressure and multi-dimensional migration	0	0	2	0.7
	18	Unfavourable dynamics and imbalances in socio-demographic structures	0	3	2	1.7

Table 5  
(continued)

Scientific realms	No.	Core problems: revised list	West Africa	Horn of Africa	East Africa	Average score
Infrastructure, services & land use	19	Poor water supply and environmental sanitation	1.5	0	3	1.5
	20	Lack of adequate infrastructure and management such as transport, energy and irrigation	2	3	2.5	2.5
	21	Limited and inadequate socio-economic services such as education, health, markets	2.7	2	3	2.6
	22	Discrimination in information and communication flows and technologies	2	0	0	0.7
	23	Inequality of ownership and access to land, natural and common property resources	0	2	3	1.7
	24	Inadequate and conflicting land use systems and technologies	0	1.4	2.5	1.3
Bio-physical & ecological	25	Inadequate availability of freshwater	0	2	3	1.7
	26	Degradation of land, soil and vegetation cover	0	2	3	1.7
	27	Degradation of forests and other natural habitats	0	2	3	1.7
	28	Pollution and overuse of renewable and non-renewable natural resources	1	0	2	1
	29	Loss of biological and agro-biological diversity	0	2	3	1.7
	30	Risks of natural and human-induced hazards and climate change	0	1	2	1

Very acute: > 2       Not very acute: ≤1 and > 0  
 Acute: ≤ 2 and > 1       Not acute: 0

the bio-physical and ecological realm (e.g. “inadequate availability of fresh-water”, “degradation of land”) or in the political and institutional realm. This great heterogeneity among the JACS gives rise to serious questions about the comparability of the JACS West Africa workshop results, based on methodological considerations. Undoubtedly, the explicit focus on health contributed to this heterogeneity.

For these reasons we will refrain from identifying patterns of a potential syndrome in the “semi-arid” context. Nevertheless, Table 5 shows quite interesting congruencies between the JACS Horn of Africa and the JACS East Africa, which may allow for further inquiry and formulation of hypotheses in future.

#### **13.4.5 The “urban and peri-urban” context**

According to the overview given in Table 6 (p. 414), the weightings assigned to urban problems in different JACS give only limited reason to suspect major topical or methodological differences. We can observe a high general scoring by the JACS East Africa, whereas scores in West Africa are generally low. Furthermore, bio-physical and ecological problems do not seem to be an issue in urban contexts in the Horn of Africa, whereas they are given high priority in South East Asia. This difference could be ascribed to the selection of participants in the respective think tanks. The same observation might be true for the few political and institutional problems and the non-relevance of poverty and insecure livelihoods in cities of West Africa. And it may also apply to the assessment that tensions, insecurity, crime and violence in urban contexts in the Horn of Africa or West Africa are not as acute as in other JACS.

Considering the average scores in the four JACS, only three core problems received a weighting indicating high importance: “lack of infrastructure and management”, “health risks and vulnerability to ill health” and “incompatible and fragile economic systems with limited market and employment opportunities”. We may recall that the latter problem was classified above as essentially a conflict between the formal and informal sectors. This incompatibility was further associated with specific problems such as limited market and employment opportunities, problems of privatisation and settings unattractive for investment. When light is shed on the least acute problems, problems that are not really relevant to urban settings become obvious. Yet it is interesting to see that in urban contexts certain other problems receive a very low score: neither “social, cultural and ethnic tensions” nor “inade-

quate legal framework and regulations” seem to be very important, nor do constraints on human rights or imbalanced socio-demographic structures. Although certain points would probably require additional verification to exclude methodological problems, further investigation of core problems not considered acute would certainly be of interest, in view of potentials and opportunities for sustainable development in urban contexts.

As was the case for the “highland and mountain” context, here, too, four JACS are the basis of comparison to examine combinations of core problems, leading to a greater number of combinations (see last column of Table 6). Setting aside repetition in all four JACS (as is the case for combination [a]), the three other combinations ([b], [c] and [d]) each occur in three out of four JACS. Allowance is again made for overlapping areas (Figure 3) since certain core problems are an element of several combinations at the same time.

The two core problems mentioned above – which were assigned the highest overall score – are also at the centre of this problem cluster in urban contexts. Combination [a], containing “incompatible and fragile economic systems” and “lack of infrastructure”, is not only an integral part of all other combina-

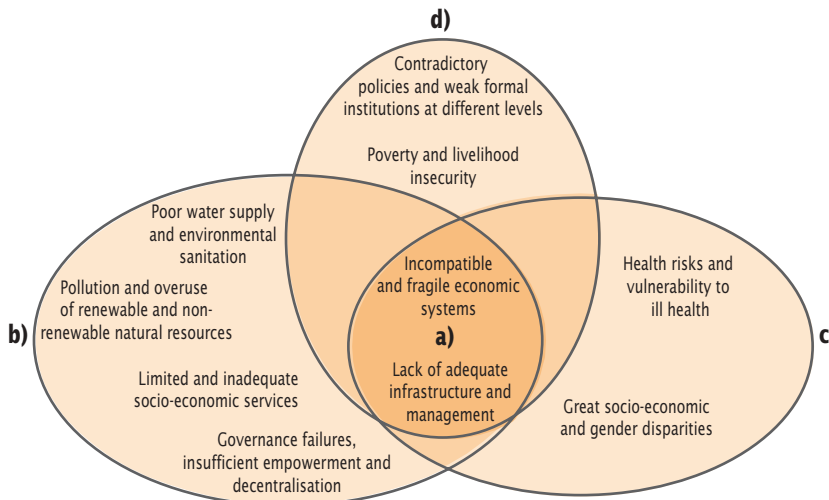


Fig. 3  
Four combinations of core problems in the “urban and peri-urban” syndrome context. As combination [a] occurs in all four JACS and combinations [b], [c] and [d] occur in three out of four JACS, they indicate possible patterns and thus a potential syndrome in the “urban and peri-urban” context.

Table 6

Weighted core problems of non-sustainable development for the “urban and peri-urban” syndrome context. Average score per core problem and patterns of core problems: a) repetition of combinations in all four JACS (weighting always > 0); b) – d) repetition of combinations in three out of four JACS (weighting always ≥ 1.5).

Scientific realms	No.	Core problems: revised list	West Africa	Horn of Africa	East Africa	South East Asia	Average score	Combinations that form patterns
Political & institutional	1	Weak international geopolitical position and negotiation power	0	0	0	3	0.8	
	2	Dominating and conflicting world views and ethical values	0	2	3	0	1.3	
	3	Contradictory policies and weak formal institutions at different levels	0	1.5	3	2.5	1.75	d
	4	Inadequate legal framework and regulations, lack of enforcement and means	0	0	0	2	0.5	
	5	Erosion of traditional and/or indigenous institutions	0	0	1	0	0.25	
	6	Governance failures, insufficient empowerment and decentralisation	3	0	2	1.7	1.7	b
	7	Unequal distribution of power and resources, corruption	0	2	2.5	0	1.1	
Socio-cultural & economic	8	Social, cultural and ethnic tensions and insecurity	0	0	2.5	0	0.6	
	9	Prevalence of crime, violence and violent conflicts	0	0	2.5	2	1.1	
	10	Unused or restricted innovative capacities and knowledge	0	0	1.5	2	0.9	
	11	Great socio-economic and gender disparities	3	2	2	0	1.8	c
	12	Incompatible and fragile economic systems with limited market and employment opportunities	3	2	3	1.7	2.4	a b c d
Population & livelihood	13	Dominance of the global economy over national development	0	2	3	0	1.3	
	14	Restrictions on human rights and individual development potential	0	0	2	0	0.5	
	15	Poverty and livelihood insecurity	0	2.5	2.5	2	1.6	d
	16	Health risks and vulnerability to ill health	3	2	3	0	2	c
	17	Population pressure and multi-dimensional migration	0	0	3	2	1.3	
	18	Unfavourable dynamics and imbalances in socio-demographic structures	0	2	0	0	0.5	

Table 6  
(continued)

Scientific realms	No.	Core problems: revised list	West Africa	Horn of Africa	East Africa	South East Asia	Average score	Combinations that form patterns				
								a	b	c	d	
Infrastructure, services & land use	19	Poor water supply and environmental sanitation	1.5	0	3	2.6	1.8		b			
	20	Lack of adequate infrastructure and management such as transport, energy and irrigation	3	2	2.5	2.3	2.5	a	b	c	d	
	21	Limited and inadequate socio-economic services such as education, health, markets	3	0	3	1.3	1.8		b			
	22	Discrimination in information and communication flows and technologies	3	0	0	3	1.5					
	23	Inequality of ownership and access to land, natural and common property resources	0	1.5	2	0	0.9					
	24	Inadequate and conflicting land use systems and technologies	0	0	2	2	1					
Bio-physical & ecological	25	Inadequate availability of freshwater	0	0	1	3	1					
	26	Degradation of land, soil and vegetation cover	0	0	1	0	0.3					
	27	Degradation of forests and other natural habitats	0	0	1	2	0.8					
	28	Pollution and overuse of renewable and non-renewable natural resources	3	0	2	2.5	1.9					
	29	Loss of biological and agro-biological diversity	0	0	2	0	0.5		b			
	30	Risks of natural and human-induced hazards and climate change	0	0	2	3	1.3					

Very acute: > 2

Not very acute: ≤1 and > 0

Acute: ≤ 2 and > 1

Not acute: 0



tions of core problems, but also occurs in all four JACS. The fact that infrastructure is such an important issue might seem somewhat surprising. Nevertheless, if we recall that this aspect comprises housing, city services, transportation, energy supply, etc., it becomes clear that it is a very important condition of development.

Having made this observation about these two central problems, we can now search for additional characteristics of the urban problem cluster by observing the other combinations. For example, interpretation of combination [b] might lead to the assumption that the problem of fragile economic systems could be associated with the problem of lacking socio-economic services on the one hand and governance failures on the other hand. Simultaneously, we could suggest a relationship between the lack of infrastructure and the problems of water supply, environmental sanitation and the pollution and overuse of resources. Combination [d] underlines the central aspect of economic problems by associating it with “poverty and livelihood insecurity” and the issue of “contradictory policies and weak institutions”. Finally, combination [c] links the central problems closely with socio-economic and gender disparities as well as health problems. It is not surprising that these problems are named simultaneously – nevertheless, the underlying processes need to be illuminated.

In conclusion, we need to recall that these combinations – which appear as patterns throughout the JACS – must be considered as hypotheses. They require further investigation for confirmation as a syndrome in the “urban and peri-urban” context, as suggested by Figure 3. The questions that guide research must tackle the underlying processes responsible for the occurrence of the above-mentioned problems.

Table 7

JACS	Context	Highland and mountain	Highland – low-land interactions	Semi-arid	Urban and peri-urban
West Africa				0.6	0.9
East Africa		1.8	2.1	2.2	2.1
Horn of Africa		1.0	1.3	1.5	0.7
South East Asia		1.1	1.0		1.4
South America		0.8			
<b>Average</b>		<b>1.2</b>	<b>1.5</b>	<b>1.4</b>	<b>1.3</b>

Comparison of total average weightings attributed to each syndrome context in a JACS, indicating the relative acuteness of syndromes in each JACS analysed.

Very acute: > 2       Potentially acute: ≤1 and > 0  
 Acute: ≤ 2 and > 1       Not assessed/not relevant: 0

## 13.5 Acuteness of syndromes and overall acuteness of core problems

### 13.5.1 Acuteness of syndromes according to JACS

Having presented all four syndrome contexts separately by looking at the weightings attributed to core problems and the resulting combinations and patterns, we need to broaden our focus again. First we would like to know in what region the assumed syndromes are particularly acute. In other words, we shall try to confirm or falsify the hypotheses formulated in Chapter 1.5 (p. 19), which were based on literature and expert knowledge. Table 7 shows the information available from the preceding analysis, corresponding to the average scores attributed to each context in each JACS. Yet from a methodological point of view, we must warn against rash interpretations of this table. As the criteria for assigning weightings were not exactly the same in each workshop, comparison of average scores for the JACS is not really valid. In other words, we should read along the horizontal lines instead of along the columns of Table 7, to get indications of the relative acuteness of syndromes in each JACS. Conversely, it would be wrong to claim that the syndrome in the “urban and peri-urban” context is most acute in East Africa.

Table 8

Average scores of weightings attributed to core problems of non-sustainable development in JACS and total (weighted) average scores for core problems.

Scientific realms	No.	Core problems: revised list	Regional Weightings					Average score (weighted by n)	Rank
			West Africa n=2	East Africa n=4	Horn of Africa n=4	South East Asia n=3	South America n=1		
Political & institutional	1	Weak international geopolitical position and negotiation power	0	0	2	1	0	0.8	13
	2	Dominating and conflicting world views and ethical values	0	1.8	1.3	0	0	0.9	12
	3	Contradictory policies and weak formal institutions at different levels	0	2.3	2.3	2.2	0	1.8	3
	4	Inadequate legal framework and regulations, lack of enforcement and means	0	0	0	1.8	2	0.5	16
	5	Erosion of traditional and/or indigenous institutions	0	2.3	1.3	1.3	0	1.3	8
	6	Governance failures, insufficient empowerment and decentralisation	2	2.5	1.3	2	2.5	2	1
	7	Unequal distribution of power and resources, corruption	0	2	2.3	0	3	1.4	7
Socio-cultural & economic	8	Social, cultural and ethnic tensions and insecurity	0	2.1	1.3	1.7	3	1.6	5
	9	Prevalence of crime, violence and violent conflicts	0	2.4	0.5	1	2	1.2	9
	10	Unused or restricted innovative capacities and knowledge	0	1.5	0.5	0.7	1	0.8	13
	11	Great socio-economic and gender disparities	3	2	1.8	0.7	0	1.7	4
	12	Incompatible and fragile economic systems with limited market and employment opportunities	2.3	2.5	1.5	1.6	2	2	1
Population & livelihood	13	Dominance of the global economy over national development	0	1.8	1.5	0	0	0.9	12
	14	Restrictions on human rights and individual development potential	0	2	0	0	0	0.6	15
	15	Poverty and livelihood insecurity	0	2.1	2.1	2.3	3	1.9	2
	16	Health risks and vulnerability to ill health	2.5	2.5	1	1	0	1.6	5
	17	Population pressure and multi-dimensional migration	0	2.8	0	1.1	0	1	11
	18	Unfavourable dynamics and imbalances in socio-demographic structures	0	2	2	0.3	0	1.2	9

Table 8  
(continued)

Scientific realms	No.	Core problems: revised list	West Africa n=2	East Africa n=4	Horn of Africa n=4	South East Asia n=3	South America n=1	Average score (weighted by n)	Rank
Infrastructure, services & land use	19	Poor water supply and environmental sanitation	1.5	2.5	0	0.9	0	1.1	10
	20	Lack of adequate infrastructure and management such as transport, energy and irrigation	2.5	2.3	1.8	1.7	2	2	1
	21	Limited and inadequate socio-economic services such as education, health, markets	2.9	2.5	1	1.2	0	1.7	4
	22	Discrimination in information and communication flows and technologies	2.5	0	0.5	1	0	0.7	14
	23	Inequality of ownership and access to land, natural and common property resources	0	2.5	2.3	1	1	1.7	4
	24	Inadequate and conflicting land use systems and technologies	0	2.1	1	1.7	1	1.3	8
Bio-physical & ecological	25	Inadequate availability of freshwater	0	2	0.8	2	0	1.2	9
	26	Degradation of land, soil and vegetation cover	0	2.5	1.3	1	0.6	1.3	8
	27	Degradation of forests and other natural habitats	0	2.5	0.8	1.7	2	1.5	6
	28	Pollution and overuse of renewable and non-renewable natural resources	2	2.1	0	0.8	0	1.1	10
	29	Loss of biological and agro-biological diversity	0	2.8	0.5	1.3	0	1.2	9
	30	Risks of natural and human-induced hazards and climate change	0	2	1.5	1	0	1.2	9

Very acute: > 2       Not very acute: ≤ 1 and > 0  
 Acute: ≤ 2 and > 1       Not acute: 0

### 13.5.2 Compiled list of weighted core problems

We are also interested to know which core problems linked to global change were considered the most acute in the different JACS, independent of specific syndrome contexts. Furthermore, we want to know what the most acute core problems are, independent of a specific syndrome context and a specific JACS. The results are presented in Table 8 (p. 418). This table not only gives an overview of weightings in each JACS, but also a weighted average for all JACS. This made it possible to establish a ranking according to the general acuteness of problems (last column).

If we look first at the JACS columns, we perceive clear differences between the different regions. As noted earlier, East Africa perceived the acuteness of core problems to be generally greater than other JACS did. In West Africa less weight was assigned to political and institutional problems and to biophysical and ecological issues. Finally, problems in South America seem to be concentrated in the political and institutional realm and the socio-cultural and economic realm. Of course, these observations might just underline the fact that each JACS is a distinct region and that, correspondingly, the acuteness of problems of global change varies. But as pointed out at the beginning of this chapter, we have reasons to assume that the main differences are of a methodological nature, e.g. the composition of think tanks and their thematic focus, the criteria established for weighting, etc. In this sense it is clear that we must be very careful when making direct comparisons between weightings assigned in the JACS.

Despite these reservations, the average ranking of core problems can easily be justified from a methodological point of view. Independent of syndrome contexts, the five core problems of global change considered most acute were:

- Governance failures, insufficient empowerment and decentralisation;
- Incompatible and fragile economic systems with limited market and employment opportunities;
- Lack of adequate infrastructure and management;
- Poverty and livelihood insecurity;
- Contradictory and inadequate policies.

Conversely, the three core problems of global change considered least acute were:

- Inadequate legal framework and regulations, lack of enforcement and corresponding means;
- Restrictions on human rights and individual development potential;
- Discrimination in information and communication flows and technologies.

## 13.6 Conclusions

The present chapter has attempted to synthesise the outcomes of eight JACS workshops described in the second part of this publication. As mentioned in Chapter 3 and confirmed in the preceding chapters, there was considerable diversity in terms of content as well as applied methodologies. Although this diversity was creative and highly productive, it restricted comparability and hence the possibilities of synthesis. Nevertheless, the efforts described in the present chapter produced a number of significant outcomes, of which the synopsis of syndrome contexts is a first important result. We have seen that discussing the meaning and understanding of the different syndrome contexts more clearly is a pre-condition for integration and synthesis within the NCCR North-South. We have also had to realise that certain syndrome contexts cannot be compared at this point, although they carry the same label. Furthermore, we have recognised that the “highland-lowland” syndrome context has to be split into two sub-contexts, for a clearer differentiation between highland and mountain areas and aspects of interaction, as these are too distinct. It is therefore probable that two syndromes will be defined within this context.

Once this basis for comparison was clarified, we were able to tackle the establishment of a consolidated list of core problems – a further pre-condition for comparing the weighting of problems between the JACS. This process proved to be a very fruitful exercise, since the diversity of workshops contributed to a very rich and differentiated image of relevant core problems of global change. Generally speaking, the list formulated in Montézillon was largely confirmed, and the problems anticipated by northern experts were remarkably complete. Nevertheless, some important additions and modifications had to be made. First, additional core problems were

identified and had to be added to the list (e.g. “weak geopolitical position and lack of negotiation power”, “imbalances in socio-demographic structures”, “limited and inadequate socio-economic services”, “inadequate and conflicting land use systems”, etc.). Second, certain existing core problems had to be amended by specific aspects that should be explicitly addressed (e.g. legal frameworks and their enforcement, erosion of indigenous institutions, gender disparities, entitlement to land and resources, etc.). Third, great differentiation among certain core problems called for a separation of too generally formulated problems into more precise sub-problems. All these modifications produced a new list of 30 core problems. This list needs to be further elaborated within the framework of the NCCR North-South for two reasons. First, a consensus must be reached on the different modifications and their compatibility with JACS situations. Second, the modified list might reveal certain new aspects to researchers already working on specific core problems, which they ought to take into consideration. Furthermore, IPs and JACS may have to reconsider allocation of resources and expertise in order to address identified core problems adequately.

When it came to comparing the weightings of core problems according to the different syndrome contexts, the basis for comparison was further restricted by methodological constraints: an average of three to four JACS remained per syndrome context. Nevertheless, we think that this small database made it possible to attempt a reasonable characterisation of syndrome contexts by describing the most important core problems and by identifying initial combinations of core problems – patterns that indicate potential syndromes of global change. For two syndrome contexts – “highland and mountain” and “urban and peri-urban” – a set of four patterns was determined, which allows for hypotheses on syndromes of global change. For the “highland-lowland interactions” context, only two patterns could be identified, which nonetheless give certain indications of a potential syndrome. However, we should recall that these interactions have different characteristics in different JACS, which must be taken carefully into account in future research. With regard to the “semi-arid” context, the available information had to be questioned for methodological reasons. As a consequence, it was not possible to establish a hypothesis relating to a syndrome in the “semi-arid” context.

These preliminary hypotheses on syndromes of global change give reason to believe that the three syndrome contexts can be clearly distinguished from each other, as the patterns identified are also different from one another. Conversely, each syndrome context is relatively homogeneous in rela-

tion to core problems of non-sustainable development in the different JACS – a basic hypothesis for the definition of syndrome contexts postulated in Chapter 3.

To conclude, we should briefly reflect on the relevance of the present synthesis for future research within the NCCR North-South. Although the basis for comparison was somewhat restricted due to methodological diversity, the synopsis of contexts and core problems yielded valuable results: the revised core problem list, and the hypotheses on four syndromes of global change to an even greater extent, constitute the basis for a potential set of common research questions. In other words, we see a considerable potential for intensifying research within the different syndrome contexts, with a view to further integration within the framework of the entire programme. This implies that context-oriented research should be strengthened, and that the partnership institutions in the JACS should ensure that all relevant contexts in their regions are adequately addressed. Concretely, the basis for the above comparison could be broadened if the methodological problems in Central Asia, Central America, South America and South Asia can still be overcome. This would make it possible not only to refine the postulated hypotheses, but also to involve the missing JACS in the further research process on syndrome contexts. At a later stage, when studying the underlying processes and verifying hypotheses, certain syndrome contexts not yet addressed can still be added for comparison, e.g. the urban contexts in Central and South Asia, the highland context in Central America, or the semi-arid context in South Asia. It will also be very interesting to extend this comparison to the JACS Alps, whenever feasible. Finally, the potentials and opportunities for sustainable development must also be integrated into the future research process, as has already been done in the South Asia workshop. Analysis of the core problems judged to be the least acute in the different syndrome context might be an entry point for this purpose. Finally, it is probable that some of these suggested research efforts are not yet part of the IP research agendas. Hence it is urgent to allocate the necessary resources and expertise to pursue these studies.





# 14 Designing Future Research Projects in an Integrated Framework

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## Abstract

As a follow-up to the eight regional SPSP workshops in the summer of 2001, an initial international conference of the NCCR North-South was held in Grindelwald from 18–21 September 2001 to lay the groundwork for long-term mitigation research on major syndromes in urban and peri-urban, semi-arid and highland-lowland contexts. This important step was a necessary compromise between the needs enumerated in the regional syntheses and the potential capacity and competence of the participating institutions. The main result of the conference was a draft matrix showing where IPs are involved in the different JACS regions worldwide. In addition, topics of global relevance and scope were defined. While the draft matrix was developed during the conference, its refinement at the regional level took a further nine months. Based on this final matrix, IPs and their partners in each region defined research themes. In the last section of the present chapter, the final matrix of June 2002 is compared with the list of studies that were initiated in the following 12 months; i.e. until June 2003. The results show that all institutional members of the programme have sufficiently complied with the matrix, but that closer cooperation on the part of IPs in various JACS is still necessary. Most IPs have more than adequately covered the core scientific fields in the regions they chose to focus on. Finally, the NCCR North-South remains fully committed to strengthening mutual cooperation, not only through partnerships between Swiss and other research institutions, but also between research and other sectors, in order to further enhance added value through locally-rooted generalisations and direct local applications.

## 14.1 The first NCCR North-South conference

An initial international NCCR North-South conference was held in Grindelwald from 18–21 September 2001. It was the concluding event of the Syndrome Pre-Synthesis Project (SPSP) as well as the first General Assembly of the NCCR North-South programme (NCCR North-South, 2002). The conference provided an opportunity to create a further synthesis of regional experience gained during the SPSP workshops and enabled members of the global team to establish initial interdisciplinary and intercultural contacts. The greatest challenge of the meeting for participants, however, was exposure to the different theoretical and methodological concepts emanating from very different backgrounds and schools of thought. While some divergence in perception of concepts and approaches remained, participants signalled their desire to work towards identification and definition of common ground during the first phase of the NCCR North-South and – more importantly – to begin mitigation research in joint teams and working groups. Programme instruments such as the Scientific Forum, Transversal Topics, Global Overviews and JACS research have since made it possible to pursue this objective thoroughly and make progress towards the three overall goals of the NCCR North-South: research partnerships, capacity building and social empowerment.

As underlined in the conference proceedings (NCCR North-South, 2002), the overall goal of the Grindelwald conference was to lay the groundwork for long-term mitigation research on major syndromes in urban and peri-urban, semi-arid and highland-lowland contexts. The conference was organised for participants who had already taken part in the pre-synthesis workshops held in the eight regions worldwide that were defined as JACS. These participants met with a composite group of Swiss researchers from the different institutions involved in the SPSP and NCCR North-South projects. A total of 62 participants from 22 different countries and all JACS regions, representing more than 20 disciplines, attended the conference.

The three-day programme was divided into nine different sessions, including a field trip in the JACS Alps region. The initial sessions allowed participants to become mutually acquainted with the different JACS of the NCCR North-South. Presentations included brief introductions to the regions, a summary of core problems identified and weighted in selected syndrome contexts, a list of possible research themes, and conceptual issues identified as critical and requiring further discussion. The next sessions focused on the

syndrome approach as the programme's general conceptual framework. During the NCCR North-South General Assembly, conceptual aspects and the management structure were addressed; the most important issues were discussed further in working groups.

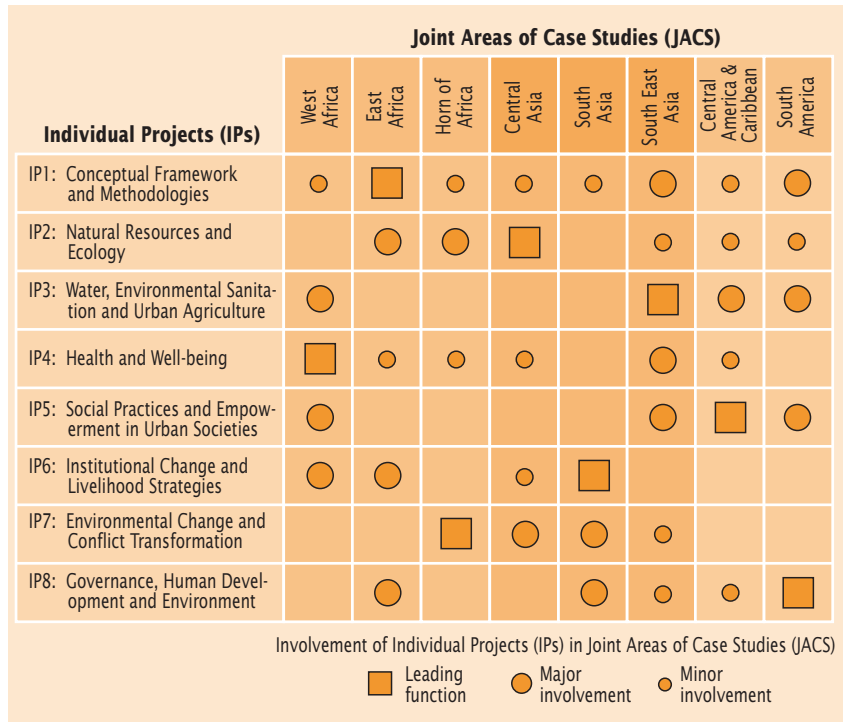
This was followed by sessions that focused on constructing a framework for further collaboration among JACS and IPs. In a preliminary step, the syndrome contexts identified by the different JACS were compared with the three major syndrome contexts originally proposed by the NCCR North-South. Two of the original contexts were adopted without change ("semi-arid" and "urban and peri-urban"), while the third was sub-divided into a "highland and mountain" and a "highland-lowland interactions" context. For some themes, definition as sub-contexts within the framework of the original proposal was not possible; instead, these themes will be dealt with as Transversal Topics. Two themes could not be integrated anywhere. The second step involved design of a matrix that correlated the major research themes identified by each JACS with the topical interests of the different IPs. The matrix designed in Grindelwald is an important tool for further communication between IPs and JACS (see Chapter 14.2).

Finally, the last session was devoted to discussion of follow-up activities and institutional and organisational matters with which the NCCR North-South programme is concerned. It also contained an evaluation of the workshop that illuminated many positive aspects as well as major challenges for the future. These related mainly to the importance of making this programme a common undertaking of all partners. This implies time and platforms for bilateral and multilateral discussions at the topical as well as conceptual levels, access to and distribution of information, and the deliberate strengthening of communication channels in all directions.

## 14.2 The NCCR North-South research matrix

After the Grindelwald Conference, the matrix of involvement by each of the eight Individual Projects in each of the eight JACS was further discussed and negotiated, resulting in the collaborative network presented in Figure 1. The ninth region, the JACS Alps, was not covered at that stage because of its special function within the NCCR North-South.

Fig. 1  
Involvement of Individual Projects (IPs) in Joint Areas of Case Studies (JACS), as agreed by the Board of the NCCR North-South in early 2002. Not shown is the JACS Alps region.  
Source:  
NCCR North-South 2002



According to Figure 1, each IP would have a leading function in one JACS, i.e. be responsible for establishing a Regional Coordination Office (RCO), developing formal agreements for research partnerships, identifying institutional partners and managing the financial resources allocated to the JACS regions (squares in Figure 1). Certain IPs would have a major involvement (large circles in Figure 1) if they had at least one researcher working on a PhD and/or several researchers at the MSc level in the JACS region, coordi-

nated by another IP. Finally, the small circles in Figure 1 denote minor involvement, e.g. by providing methodological assistance, supervisory functions for PhD and MSc candidates, or supporting training in the region. A summary of research themes identified by 30 June 2003 in each JACS region is listed in the boxes in section 14.3. Figure 1 shows that there was no attempt to have the matrix fully covered, as a focus on comparative advantages was seen as more beneficial.

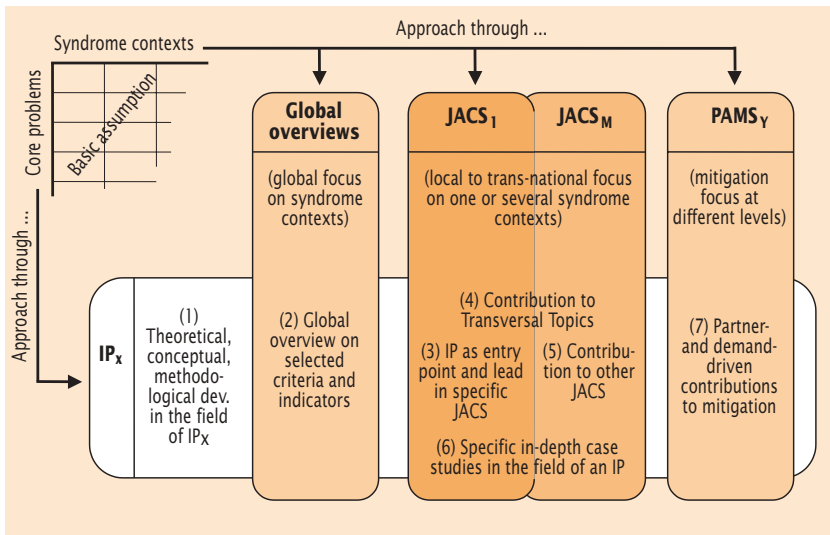


Fig. 2  
The framework of syndrome mitigation research pursued by the NCCR North-South.

Figure 2 gives an overview of the research approach and the different research directions taken by the programme, emphasising the need to find an iterative and pragmatic balance between disciplines and the case studies they undertake, as well as integrative approaches and steps. While the involvement of IPs in the different JACS constitutes the main focus of the NCCR North-South approach, each IP was also invited to contribute to the overall scientific concept and methodology, as well as to theoretical, conceptual and methodological development in its own disciplinary realm. This is shown as a “horizontal” activity (1) in Figure 2. Under the guidance of IP1, a scientific forum was established to review, refine and amend the syndrome concept and the concept of syndrome mitigation, in order to increase their general relevance and suitability in forming an integrative conceptual

framework for the NCCR North-South. The forum also pays specific attention to relations among, and integration of, key concepts developed and applied in IPs 2 through 8 (sustainable livelihood, gender, governance, social learning, sustainable resource management, risk and vulnerability). In addition, it promotes, evaluates and compiles concrete transdisciplinary strategies that make it possible to increase the permeability of scientific disciplines and societal categories. This will strengthen the NCCR North-South as a centre of applied transdisciplinarity, while also making it possible to deduce principles from and for practical experience. Some examples of research that contribute to the overall framework have been mentioned in Annual Report No. 2 of 31 March 2003 and are listed here (see Box).

A further integrative element shown in Figure 2 is the global positioning of syndrome contexts and other general issues. In this respect, Global Overviews are being compiled of the syndrome contexts and core problems tackled within the NCCR North-South, taking account of their spatial and temporal variables, in order to evaluate the acuteness of context-specific clusters of problems and assess the relevance of cases and contexts studied within the programme. This is shown in Figure 2 as a specific approach (2) of each IP.

The research themes pursued in each JACS have a local to transnational focus on one or several syndrome contexts, forming the bulk of activities of the NCCR North-South. The lead IP in its specific JACS will naturally have

**Examples of general research themes valid for all contexts:**

- Indicator-based syndrome assessment and approaches to sustainable development (so-called ‘Global Overviews’ – IP1 in collaboration with all other IPs)
- Social learning and negotiation platforms in natural resource management (IP1)
- Global Overviews of natural resource degradation (IP2)
- Global Overviews of environmental sanitation and urban agriculture (IP3)
- Negotiated management of forest commons (IP8)

Source:  
NCCR North-  
South, 2003

a major part of ‘its’ studies located in its ‘own’ JACS (see (3) in Figure 2). But some research themes are also designed to contribute to Transversal Topics (4) and other JACS (5), while others are more in-depth studies that primarily advance the development of disciplinary knowledge (6).

Finally, concrete actions focusing on syndrome mitigation would be compiled through “Partnership Actions for Mitigating Syndromes” (PAMS), proposed by partners and institutions in JACS regions, in collaboration with the programme (see (7) in Figure 2). Experiences with PAMS will be generalised, with a view to assisting stakeholders and development agencies in the formulation, planning and implementation of projects and policies. Principles and instruments of syndrome mitigation should be tested and refined by implementing concrete mitigation and planning processes, such as multi-level and multi-stakeholder negotiations, expert systems, spatial information systems and enhancement of social learning processes, all with a view to promoting practical pathways of integrated syndrome mitigation.

### **14.3 Overview of research projects in the JACS regions**

Given the great emphasis on research partnership projects in the JACS regions, this final section will provide an overview of research projects in each JACS. The boxes below show research themes as identified and/or planned until 30 June 2003, the mid-term of the four-year first phase of the NCCR North-South. By this point, each IP had developed nearly all of its PhD and post-doc research proposals, which made it possible to present and discuss them for each JACS in summary fashion.

In the JACS West Africa, most research projects focus on issues of human health and well-being, the scientific realm covered by IP4 (see Box, p. 432). Nevertheless, three other IPs have become involved in the region, IP3 and IP5 in the urban and peri-urban context, and IP6 in the semi-arid context. The two prevailing syndrome contexts are both well addressed, and the level of critical mass for research is likely to be reached for the main topic addressed. IP1 provides methodological support through its Scientific Forum.



### Major research themes in the JACS West Africa

#### *Urban and peri-urban context:*

- Exclusion, vulnerability, poverty among women, and AIDS (IP4)
- Urban social networks and illness (IP4)
- Vulnerability and risks of school children in relation to AIDS (IP4)
- Urban dynamics and health risk management (IP4)
- Urban observatories for sustainable management (IP5)
- Urban malaria transmission and vector dynamics (IP4)
- Epidemiological patterns and perceived needs for health interventions (IP4)
- Urban health risk assessment and spatial methodologies (IP4)
- Sanitary risks in rapidly growing urban settings (IP4)
- Management of solid and liquid wastes in urban settings (IP4)
- Management of sludges from on-site sanitation systems (IP3)
- Treatment of potential Endocrine Disrupting Chemicals (EDC) in water (IP4)
- Social dynamics and management of reproductive health (IP4)
- Experiences and practices related to febrile illnesses (IP4)

#### *Semi-arid context:*

- Molecular epidemiology of tuberculosis (IP4)
- Institutions of common property resource management (IP6)
- Health, vulnerability and tuberculosis in Sahelian communities (IP4)
- Human and animal health in nomadic pastoralist communities (IP4)

Source:  
NCCR North-South  
2002

The JACS East Africa is closely related to IP1, which deals with the conceptual framework and methodologies throughout the NCCR North-South. In this sense, the JACS East Africa has a leading role in developing a JACS approach that aims to build a bridge between specific case studies and integrative approaches at the level of syndrome assessment, and even more at the level of syndrome mitigation. The JACS East Africa is therefore heavily based on a think tank of senior scholars from the region, and will develop a common research framework and database that allows for multi-level and multi-stakeholder approaches. Due to its position in the overall NCCR North-South, the JACS East Africa attempts to cover all three syndrome contexts addressed by the programme. However, given the priorities set in the

JACS workshop, primary emphasis at present is being put on the highland-lowland and the semi-arid contexts. Most post-doc and PhD research projects established to date are thus concentrating on one of the two contexts, while explicitly addressing the links to the other context, e.g. in the framework of basin-wide approaches that link mountains and highlands with semi-arid lowlands. In addition, the studies address specific methodological and conceptual issues related to syndrome assessment and syndrome mitigation that are hypothetically of relevance to the overall NCCR North-South, and that can therefore be integrated into the Scientific Forum mentioned above. This is not only valid for the contributions of IP1 but also for the other IPs involved.

### Major research themes in the JACS East Africa

#### *Highland-lowland context:*

- River water abstraction and allocation modelling (IP2)
- Water use and primary productivity for smallholders (IP2)
- The role of IT in developing negotiation platforms in highland-lowland contexts (IP1)
- Institutional capacities in dealing with management, planning and conflict resolution (IP1)
- Local governance of forests (IP8)

#### *Semi-arid context:*

- Common property resources and power relations in resource-rich islands in semi-arid contexts (two projects by IP6)
- Assessment of capacities and constraints in syndrome mitigation at multiple levels (IP1)
- Potentials and limitations of Information Technology and GIS in syndrome mitigation (IP1)
- Livelihoods, vulnerability and natural resource use (two projects by IP1)
- Drought risk assessment and modelling (IP1)

#### *Urban and peri-urban context:*

- A participatory urban observatory as a tool for multi-level syndrome mitigation (IP1)
- Multi-level governance of urban marginality (IP8)

Source:  
NCCR North-South

2002

Themes for the JACS Horn of Africa have been covered as planned by the programme. IP7 focuses on resource-related conflicts and pastoralist livelihoods at the interface between nomadic and settled agriculture in semi-arid contexts, and on national and international water policies and their effects on local conflict and resource management strategies in highland-lowland contexts. IP2, on the other hand, focuses predominantly on the highlands and on sedentary farming in highland-lowland contexts, the latter including the vast majority of the population in Ethiopia, where more than 60 million people are engaged mainly in subsistence agriculture in the highlands. Methodological inputs by IP1 and IP4 have also been initiated. All the themes chosen are very important and relevant to the region, not only in Ethiopia, but also in neighbouring countries such as Sudan, Eritrea and the area that includes the former Somalia.

### Major research themes in the JACS Horn of Africa

#### *Highland-lowland context:*

- National and international water policies and local resource and conflict management (IP7)
- Land degradation and management options (IP2)
- Land transformation and opportunities for sustainable land management (IP2)
- Spatio-temporal perspectives on soil resources (IP2)
- A multi-level stakeholder approach for mitigating land degradation (IP2)
- Negotiated management of nature protection and resource management (IP2 and IP7)

#### *Semi-arid context:*

- Policies and capacities of states in dealing with environmental conflicts (IP7)
- Destruction of indigenous institutions and transformation of pastoral conflicts (IP7)
- Mitigating violent resource use conflicts in pastoral areas (IP7)

Source:  
NCCR North-South  
2002

### Major research themes in the JACS Central Asia

#### *Highland-lowland context:*

- Legal and institutional framework for sustainable mountain development (IP2)
- Knowledge generation for sustainable mountain development (IP2)
- Livelihoods in transition: strategies for coping with processes of multiple change (IP2 and IP6)
- Impact of land use on land resources in a watershed (IP2)
- Land use, climate and river runoff interactions in a watershed (IP2)
- Sustainable water management in an intermediate zone (IP2)
- Soil and water management in a semi-arid highland-lowland context (IP2)

#### *Semi-arid context:*

- Appraisal of conflict transformation in water resource management (IP7)
- Mitigation strategies for transforming freshwater conflicts (IP7)
- Land degradation and conservation in semi-arid landscapes (IP2)

Source:  
NCCR North-South  
2002

In the JACS Central Asia, close involvement between IP2 and IP7 can be observed, similar to that in the JACS Horn of Africa. Methodological support from IP6 has been secured, and IP4 has also been invited to join in; hence the programme is operating as planned. Given the great emphasis on problems of transition, which also has major consequences for the economic sphere, this challenge appears to be insufficiently covered by the research themes selected. However, great dependency on natural resources such as water, vegetation, soil, livestock and wildlife justifies initial study of these interfaces. In a later phase, however, economic considerations will have to be given greater emphasis. Finally, IP1 provides methodological support through its Scientific Forum.

### Major research themes in the JACS South Asia

#### *Urban and peri-urban context:*

- Livelihoods of marginal communities in peri-urban areas (IP6)
- Gender, governance and urban environment (IP8)
- International labour migration and rural livelihoods (IP6)

#### *Highland-lowland context:*

- Impact of participation and devolution of power on natural resource utilisation and livelihood security (IP6)
- Approaches to mitigation of environmental conflicts (IP7)
- State policies and environmental conflicts between indigenous populations and settlers (IP7)
- Settler challenges: migration, ethnicity and collective action (IP7)
- The effects of nature conservation and cultural heritage on rural livelihoods (IP6)
- Coping strategies of rural households for dealing with the threats and opportunities of economic globalisation and state decentralisation (IP6)
- International labour migration and rural livelihoods (IP6)
- Economic growth and poverty reduction at the macro level (IP6)

Source:  
NCCR North-South  
2002

IP6 – itself an interdisciplinary research team – has invested much of its resources in the JACS South Asia. Hence the programme focuses on two syndrome contexts and a macro-economic study with several PhD candidates. In addition, IP7 and IP8 have strong stakes, and IP1 provides methodological support through its Scientific Forum. Given the extended area of involvement in several countries within this JACS, the emphasis of IP6 is by no means too intense. Natural resource management issues have been prominently built into the JACS approach, given the great dependency of poor segments of the population on these resources.

In the JACS South East Asia, IP3 has invested much of its resources in strengthening local research institutions and conducting research in the urban and peri-urban context. By 30 June 2003, IP1 had ongoing activities in the highland-lowland context, while the involvement of IP4 and IP5 were still at the planning stage. Methodological support by IP2 is assured, while IP7 and

### Major research themes in the JACS South East Asia

#### *Urban and peri-urban context:*

- Alternative sanitation systems for urban and peri-urban areas (IP3)
- Potential and limitations of decentralised wastewater management (IP3)
- Application of Material Flux Analysis for strategic sanitation planning (IP3)
- Application of the Household-Centred Environmental Sanitation (HCES) Approach (IP3)
- Optimisation of water pollution control measures (IP3 and IP2)

#### *Highland-lowland context:*

- Spatial poverty analysis (IP1)
- Patterns of land cover change (IP1)

Source:  
NCCR North-South  
2002

IP8 will have to reconsider their planning for this JACS (see Figure 1). In addition, IP1 provides methodological support through its Scientific Forum.

The JACS Central America and the Caribbean is the main region of IP5, and there have not yet been any other PhD studies by other IPs. IP3 will have to reconsider its planning of a PhD or post-doc for this JACS, while the methodological inputs by IP4 and IP8 will have to be reconsidered as well. IP1 provides methodological support through its Scientific Forum, and IP2 is involved in the co-supervision of one PhD candidate.

### Major research themes in the JACS Central America and the Caribbean

#### *Urban and peri-urban context:*

- Intermediate cities and globalisation (IP5)
- Social segregation and space (IP5)
- Urban security and insecurity and public space (IP5)
- Borderland urban intermediation (IP5)
- Benefit sharing mechanism between urban and rural municipalities (IP5)

#### *Highland-lowland context:*

- Land use change and urban-rural interactions (IP5/IP2)

Source:  
NCCR North-South  
2002

### Major research themes in the JACS South America

#### *Urban and peri-urban context:*

- Governance of urban environmental risks (IP8)
- Social movements, citizenship and the management of water services (IP8)

#### *Highland-lowland context:*

- Regional governance of biodiversity (IP8)
- Indigenous knowledge and biodiversity conservation (IP8)
- Local governance of forests and citizenship (IP8)
- Communal management of resources and public policies (IP8)
- The interface between state and civil society in conservation management (IP1)
- Indigenous farmers' perceptions of the environment and their relation to the concept of ecosystem biodiversity (IP1 and IP2)
- Land use change and urban-rural interactions (IP5/IP2)

Source:  
NCCR North-South  
2002

In the JACS South America, mainly studies by IP8 and by IP1 and IP2 are being implemented, while PhD or post-doc studies have not yet been initiated by IP3 and IP5. Here the focus is strongly directed towards highland-lowland contexts. In addition, IP1 provides methodological support through its Scientific Forum.

Last but not least, in the JACS Alps, the NCCR North-South benefited from activities not directly funded by the programme, but associated with it through other SNSF programmes as well as other IP1 projects. In addition, the first Integrated Training Course (ITC) was held in Aeschiried, Switzerland, i.e. in the JACS Alps, from 9–20 September 2002. The objectives of the ITC were to train PhD candidates in the overall concept and approach of the NCCR North-South, making them aware of the variety of research conducted, positioning their individual research within the framework of the NCCR North-South, building networks and bilateral links, receiving practical assistance and elaborated tools to conduct quality research, and developing competence in inter- and transdisciplinary research.

### Major research themes in the JACS Alps

#### *Highland-lowland context:*

- Landscape and project evaluation (NRP 48)
- Management planning process for the “Jungfrau-Aletsch-Bietschhorn” World Natural Heritage Site (IP1)

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- NCCR North-South. 2003. *Annual Report No. 2, 1.4.2002–31.3.2003*. Berne: Centre for Development and Environment (internal document).





# Annexes



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*Workshop held in Kathmandu, Nepal, August 2001*

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## Annex 2

# List of Abbreviations

### A

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ACC	Central America and the Caribbean (Amérique Centrale et Caraïbes)
ACTS	African Centre for Technology Studies
ADB	Asian Development Bank
AFRENA	Agroforestry Research Network for East and Central Africa
AFRICOVER	FAO project to establish a digital geo-referenced database on land cover in Africa
AHI	African Highland Initiative (of ICRAF)
AIDS	Acquired Immuno-Deficiency Syndrome
AMA	African Mountains Association, Addis Abeba, Ethiopia
ARI	Acute Respiratory Infections
ARMA	Atlas du Risque de la Malaria en Afrique (see MARA)
ASAL	Arid and Semi-Arid Lands

### B

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BID	Banco Interamericano de Desarrollo
BIGA	Bundesamt für Industrie, Gewerbe und Arbeit, Switzerland
BSP	Biodiversity Support Programme, Washington DC, USA

### C

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CA	Central Asia
CAF	Corporación Andina de Fomento
CASS	Council of the Swiss Scientific Academies
CCAB-AP	Consejos Centroamericanos de Bosques y Áreas Protegidas (Central American Councils on Forests and Protected Areas, of CCAD)
CCAD	Comisión Centroamericana de Ambiente y Desarrollo (Central American Commission on Environment and Development), Antiguo Cuscatlán, El Salvador
CCD	see UNCCD
CDE	Centre for Development and Environment, Berne, Switzerland

CDS	Centre for Development Studies, Thiruvananthapuram, Kerala, India
CEBEM	Centro Boliviano de Estudios Multidiscipli- narios, La Paz, Bolivia
CEBIAE	Centro Boliviano de Investigación y Acción Educativas, La Paz, Bolivia
CEDLA	Centro de Estudios para el Desarrollo Laboral y Agrario, La Paz, Bolivia
CEPAL	Comisión Económica para América Latina (see ECLA)
CERES	Centro de Estudios de la Realidad Económica y Social, Boston, USA
CESR	Centre of Economic and Social Reforms, Bishkek, Kyrgyzstan
CETRAD	Centre for Training and Integrated Research in ASAL Development, Nanyuki, Kenya
CGIAR	Consultative Group of International Agricul- tural Research
CHF	Swiss Franc
CHW	Community Health Workers
CIDEM	Centro de Información y Desarrollo de la Mujer, La Paz, Bolivia
CIFOR	Centre for International Forestry Research (of CGIAR)
CIPCA	Centro de Investigación y Promoción del Campesinado, La Paz, Bolivia
CIRAD-EMVT	Centre de Coopération Internationale en Recherche Agronomique pour le Déve- loppement: Département Elevage et Méde- cine Vétérinaire
CIS	Commonwealth of Independent States
CLACSO	Consejo Latinoamericano de Ciencias Sociales (Latin American Council for the Social Sciences), Buenos Aires, Argentina
CNH	Centre National d'Hygiène, Nouakchott, Mauretania
CONAM	Consejo Nacional del Ambiente (Government of Peru)
COSUDE	Agencia Suiza para el Desarrollo y la Cooperación (see SDC)
CP	Core Problem
CPR	Common Property Resource
CREPA	Centre Régional pour l'Eau Potable et l'Assai- nissement à Faible Coût, Ouagadougou, Burkina Faso
CSD	Commission on Sustainable Development
CSRS	Centre Suisse de Recherches Scientifiques, Abidjan, Ivory Coast
CSRS-STI	Centre Suisse de Recherches Scientifiques – Swiss Tropical Institute, Abidjan, Ivory Coast
CSSI	Centre de Support en Santé Internationale, N'Djamena, Chad

## D

DFID	Department for International Development (Government of the United Kingdom)
DFPA	Desarrollo Forestal Participativo en los Andes (Participatory Forestry Development in the Andes, of FAO), Quito, Ecuador
DSIS	Division du Système d'Information Sanitaire, N'Djamena, Chad

## E

EAWAG	Eidgenössische Anstalt für Wasserversorgung, Abwasserreinigung und Gewässerschutz (Swiss Federal Institute for Environmental Science and Technology), Dübendorf, Switzerland
EAWAG/SANDEC	Department of Water and Sanitation in Developing Countries (of EAWAG), Dübendorf, Switzerland
ECLA	UN Economic Commission for Latin America (also UN ECLA)
EDC	Endocrine Disrupting Chemicals
EIER	Ecole Inter-états d'Ingénieurs de l'Équipement Rural, Ouagadougou, Burkina Faso
ENCOP	Environment and Conflicts Project (of ETHZ and Swiss Peace Foundation)
ENDA-GRAF-Sahel	Environmental Development Action – Groupes de Recherche-Action-Formation – Sahel
EPA	Environmental Protection Authority (Government of Ethiopia)
EPFL	Ecole Polytechnique Fédérale de Lausanne, Switzerland
ESUZ	Institute of Social Anthropology, Zurich, Switzerland
ETHZ	Swiss Federal Institute of Technology, Zurich, Switzerland
EU-LDC Network	European Union – Least Developed Countries Network

## F

FACES-UMSS	Facultad de Ciencias Económicas y Sociología, Universidad Mayor de San Simón, Cochabamba, Bolivia
FAO	United Nations Food and Agriculture Organization
FES	Friedrich-Ebert-Stiftung
FIA	Fundación para la Innovación Agraria, Santiago, Chile

FLACSO	Facultad Latinoamericana de Ciencias Sociales (Latin American Faculty of Social Sciences), Santo Domingo, Dominican Republic
FSS	Forum des Sciences Sociales, Addis Abeba, Ethiopia
FTPP	Forest, Trees and People Programme (of FAO)

## G

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GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographic Information System
GMS	Greater Mekong Subregion
GoE	Government of Ethiopia
GoK	Government of Kenya
GTZ	German Agency for Technical Cooperation

## H

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HCES	Household-Centred Environmental Sanitation Approach
HCMC	Ho Chi Minh City
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
HPI	Heifer Project International

## I

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ICD	Integrated Conservation and Development Approach
ICRAF	International Centre for Research in Agroforestry, Nairobi, Kenya (of CGIAR)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics (of CGIAR)
IDPM	Institute for Development Policy and Management, University of Manchester, United Kingdom
IDR	Institute of Development Research, Addis Abeba University, Ethiopia
IEP	Instituto de Estudios Peruanos, Lima, Peru
IFAD	International Forum on Accountancy Development
IGAD	Intergovernmental Authority on Development, Djibouti
IIED	International Institute for Environment and Development, London, United Kingdom
IIED-AL	Instituto Internacional de Medio Ambiente y Desarrollo – América Latina, Buenos Aires, Argentina

IISD	International Institute for Sustainable Development, Winnipeg, Canada
ILDIS	International Legume Database and Information Service, Reading, United Kingdom
ILRI	International Livestock Research Institute (of CGIAR)
IMAS	Integrated Modelling and Assessment System
INE	Instituto Nacional de Ecología (National Institute of Ecology, Government of Mexico)
INESA	Inter-Enterprises, Port-au-Prince, Haiti
IP	Individual Project
IRA	Institute of Resource Assessment, University of Dar es Salaam, Tanzania
ISCO	International Soil Conservation Organisation
IT	Information Technology
ITC	Integrated Training Course
IUCN	International Union for Conservation of Nature
IUED	Institut Universitaire d'Etudes du Développement (Graduate Institute of Development Studies), University of Geneva, Switzerland

## J

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JAB	Jungfrau-Aletsch-Bietschhorn (World Natural Heritage Site)
JACS	Joint Areas of Case Studies

## K

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KCCT	Kenya College of Communications Technology, Nairobi, Kenya
KFPE	Schweizerische Kommission für Forschungspartnerschaften mit Entwicklungsländern (der CASS); Swiss Commission for Research Partnerships with Developing Countries (of CASS), Berne, Switzerland
KIFCON	Kenya Indigenous Forest Conservation Programme

## L

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Lao PDR	Lao People's Democratic Republic
LaSUR	Laboratoire de Sociologie Urbaine (of EPFL), Lausanne, Switzerland
LCV	Laboratoire Central Vétérinaire, Bamako, Mali
LEAD CIS	Leadership for Environment and Development, Commonwealth of Independent States



LRVZ

Laboratoire de Recherches Vétérinaires et  
Zootechniques de Farcha, N'Djamena, Chad

## M

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MAB Programme

Man and Biosphere Programme

MARA

Mapping Malaria Risk in Africa (see ARMA)

MCWM

Mweka College of Wildlife Management

MIT

Massachusetts Institute of Technology

MRC

Mekong River Commission, Phnom Penh,  
Cambodia

MWR

Ministry of Water Resources, Government of  
Ethiopia

## N

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NABU

Naturschutzbund Deutschland, Bonn,  
Germany

NADEL

Post-Graduate Course on Developing Coun-  
tries, Swiss Federal Institute of Technology,  
Zurich, Switzerland

NCCR

National Centre of Competence in Research

NGO

Non-Governmental Organisation

NRA

National Reserved Area

NRP

National Research Programme

NRP 48

National Research Programme “Landscapes  
and Habitats of the Alps”

NSS

National Statistical Survey, India

## O

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OMS

Organisation Mondiale de la Santé (see WHO)

OSSREA

Organisation for Social Science Research in  
Eastern and Southern Africa, Addis Abeba,  
Ethiopia

## P

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PAMS

Partnership Actions for Mitigating Syndromes

PENHA

Pastoral and Environmental Network in the  
Horn of Africa

PFA-BOL

Programa Frontera Agrícola, Bolivia

PFI

Promoting Farmer Innovations Programme

PIEB

Programa de Investigación Estratégica en  
Bolivia, La Paz, Bolivia

PIPs

Policies, Institutions and Processes

PNUD

Programa de las Naciones Unidas para el  
Desarrollo (see UNDP)

PROADE	Proyecto de Apoyo a la Descentralización
PROMAB	Programa Manejo de Bosques de la Amazonia Boliviana, Riberalta, Bolivia
PRONAGOB	Programa Nacional de Gobernabilidad, La Paz, Bolivia

## R

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RAF	Recherche–Action–Formation (Research – Action – Capacity Building)
RCO	Regional Coordination Office
REC	Regional Ecological Centre, Almaty, Kazakhstan
RELMA	Regional Land Management Unit, Nairobi, Kenya
RFLP	Restriction Fragment Length Polymorphism
RGA	Revue de Géographie Alpine
RWH	Rainwater Harvesting

## S

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SAARC	South Asian Association for Regional Co-operation
SAGW	Schweizerische Akademie der Geistes- und Sozialwissenschaften
SARI	Selian Agricultural Research Institute, Arusha, Tanzania
SARPI	Swiss Association of Research Partnership Institutions
SCAPA	Soil Conservation and Agroforestry Project, Arusha, Tanzania
SCICWC	Scientific Centre of Interstate Coordination Water Committee, Almaty, Kazakhstan
SCRP	Soil Conservation Research Programme, Ethiopia
SDC	Swiss Agency for Development and Co-operation
SDPI	Sustainable Development Policy Institute
SEMARNAT	Secretaría del Medio Ambiente y Recursos Naturales (Secretariat of Environment and Natural Resources, Government of Mexico)
SEMILLA	Centro de Promoción de Servicios Múltiples, La Paz, Bolivia
SKAT	Swiss Centre for Development Cooperation in Technology and Management
SNPP	Secretaría Nacional de Participación Popular, La Paz, Bolivia
SNSF	Swiss National Science Foundation
SPPE	Swiss Priority Programme Environment
SPSP	Syndrome Pre-Synthesis Project

SSP	Strategic Structure Plan, Nakuru, Kenya
STI	Swiss Tropical Institute, University of Basel, Switzerland
SUA	Sukuine University of Agriculture, Morogoro, Tanzania
SUPF	Strategic Urban Planning Framework, Dar es Salaam, Tanzania

## T

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TAC	Transnational Audit Committee
TB	Tuberculosis
TIRDO	Tanzania Industrial Research Development Organisation

## U

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UCLAS	University College of Lands, Architecture and Surveying
UCPOI	Unidad de Coordinación con Pueblos y Organizaciones Indígenas
UIA	Universidad Iberoamericana
UN	United Nations
UNAM	Universidad Nacional Autónoma de México, Mexico City, Mexico
UNCCD	United Nations Convention to Combat Deser- tification
UNCED	United Nations Commission on Economic Development
UNCHS	United Nations Centre for Human Settlements (also UN-HABITAT)
UNCRD	United Nations Centre for Regional Devel- opment
UNDP	United Nations Development Programme
UNDP-GEF SGP	UNDP-GEF Small Grants Programme (see UNDP, GEF)
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNEW	University of Newcastle upon Tyne, United Kingdom
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNSO	UNDP Office to Combat Desertification and Drought
USD	US Dollar

## V

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VU	Vrije Universiteit Amsterdam, The Nether- lands
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## W

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WBGU	Wissenschaftlicher Beirat der Bundesregierung für Globale Umweltveränderungen (German Advisory Council on Global Change)
WCED	World Commission on Environment and Development
WDP	Women's Development Programme, Nepal
WHO	World Health Organisation
WOCAT	World Overview of Conservation Approaches and Technologies
WRI	World Resources Institute, Washington DC, USA
WSSCC	Water Supply and Sanitation Collaborative Council, Geneva, Switzerland
WTO	World Trade Organisation

## X

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Xin Jiang UAP	Xin Jiang Uigur Autonomous Province, China
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Syndromes of global change can be observed in many regions of the world. Mitigating such syndromes is a vital task for the international community and a precondition for sustainable development. Research institutions in particular need to confront the challenge of contributing to mitigation efforts. International research partnerships are one vehicle that can be employed for mutual strengthening of capacity and competence in syndrome mitigation research.

In 1999 the Swiss government invited Swiss research institutions to propose a series of National Centres of Competence in Research (NCCRs) in order to strengthen Switzerland's position in the international research arena. One of the 14 finalists chosen in a competitive selection process involving more than 230 proposals, the "NCCR North-South" proposal dealt with international partnerships for development-oriented research. The NCCR North-South is funded by the Swiss National Science Foundation (SNSF), the Swiss Agency for Development and Cooperation (SDC), and participating research institutions in Switzerland and over 20 countries worldwide.

The present publication is the final outcome of the "Syndrome Pre-Synthesis Project" (SPSP), a preparatory project initiated in 2001 to pave the way for the NCCR North-South. The SPSP applied a transdisciplinary approach to identify research partnerships for development in 8 regions of the world. It included a preparatory workshop in Switzerland and 8 international workshops: 3 in Africa, 3 in Asia and 2 in South America, held between April and September 2001. Each workshop made a qualitative appraisal of core problems and major "syndrome contexts" in its particular region, focusing mainly on the urban and peri-urban, semi-arid and highland-lowland syndrome contexts.

The primary aim of the present publication is to present an initial synthesis of core problems in each region, the status and focus of related research, and corresponding new research needs. Based on the results of this participatory process, the NCCR North-South programme followed up on the outcomes of the regional syntheses by identifying future research aims along the general lines determined in the workshops. By 2004, over 100 (mainly part-time) post-doctoral researchers and more than 60 PhD fellows were implementing long-term research projects focusing on syndrome mitigation and sustainable development in these 8 regions. Their collaboration within a single programme allows for significant added value through mutual learning, in terms of both methodology and content. Although the needs in partner regions are much greater than what the NCCR North-South can fulfil, the programme represents a first step towards reducing global disparities in research, knowledge sharing and development.