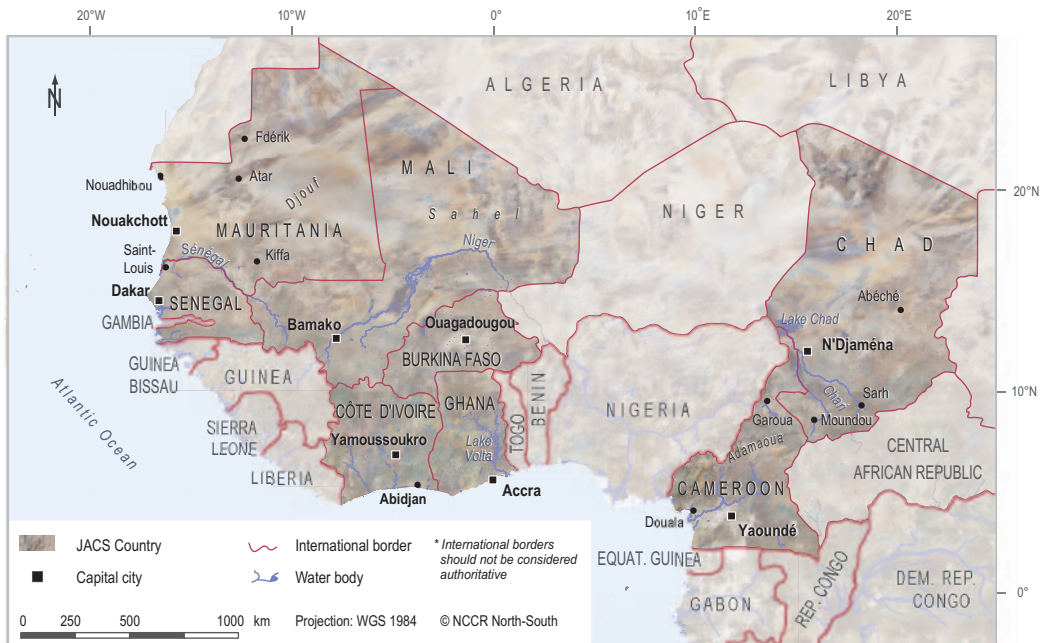


## Part I

# Research for Development in West Africa: Vulnerability, Health Risks and Institution Building





# **1 Health, Sanitation, Autochthony and Integration: Urban and Rural Development Challenges in West Africa**

Guéladio Cissé<sup>1</sup>

## **1.1 Selected development-relevant research themes**

### **1.1.1 Core problems, potentials and contexts in the region**

West African countries are facing major changes and problems that require a conjunction of different efforts and disciplinary skills to find the most appropriate and sustainable solutions. Core problems requiring careful consideration in West Africa were identified, classified and synthesised during a participatory workshop organised in Abidjan, Côte d'Ivoire, by the Swiss National Centre of Competence in Research (NCCR) North-South "Syndrome Pre-Synthesis Project" (SPSP) in 2001. All 21 core problems identified (Tanner et al 2004) in the NCCR North-South's Joint Area of Case Studies (JACS)<sup>2</sup> West Africa (WAF) were linked to sustainable development challenges in the region. Poverty, environmental degradation, conflicts, poor sanitation, health and institutions – in both urban and rural contexts – were the issues that workshop participants emphasised most.

The NCCR North-South programme made it possible to launch several research projects as well as Partnership Actions for Mitigating Syndromes (PAMS)<sup>3</sup> in West Africa, with a focus on analysis of syndromes of global change (Hurni et al 2004) on the one hand, and on mitigating syndromes, on the other. The projects were primarily concerned with three themes: 1) *Vulnerability and Resilience*; 2) *Health Risk Management and Equity Effectiveness*; and 3) *Institutions, Public Space and Conflicts*.

### **1.1.2 Approach and selection of three themes**

The burdens of malaria, HIV/AIDS, gastro-intestinal parasites and several major diseases in both rural and peri-urban contexts are linked to poverty, vulnerability and resilience among the populations affected (Cham-

bers 1989; Moser 1998; Tanner and Mtasiwa 2001; Kjellstrom et al 2007; Obrist and Tanner, in preparation). Success in combating these diseases thus depends on taking the related issues into account. Due to the complexity of social and economic problems in the two targeted contexts in West Africa, the multidisciplinary team of scientists from the North and the South working in the JACS WAF adopted a common conceptual framework for a first regional synthesis theme concerned with *Vulnerability and Resilience* (Cissé and Tanner 2006; see Chapter 2 in the present volume).

The costs of inadequate water supply and sanitation (WSS) are high (WHO 2009; World Bank 2009). About 1.6 million children die every year from diarrhoea, mainly as a result of inadequate sanitation, water supply and hygiene (Feachem et al 1983; Esrey et al 1991; WHO 2009; World Bank 2009). By 2020, half of the developing world's population will be living in urban centres, including the informal settlements that now account for 40–70% of the population in many cities in developing countries. Thus, the main challenge for team research carried out in West Africa concerned a second synthesis theme, *Health Risk Management and Equity Effectiveness*: to come up with innovative approaches and hypotheses for managing health and sanitation risks and providing sanitation and health equitably to neglected populations, in urban and semi-arid areas (see Chapter 3 in the present volume).

For decades several countries in West Africa have been marked by major social and political crises. Tensions are linked in many cases to discourse on and different interpretations of 'autochthony', 'citizenship', 'locals', 'non-locals', 'nationals', and 'foreigners' (Bayart et al 2001; Ceuppens and Geschiere 2005). The weakness of institutions and the 'presence-absence' of the state are at the heart of the issue. These factors benefit certain powerful local actors who attempt to maintain, revitalise or transform traditional rules to increase their power over resources (Geschiere 2005). A group of NCCR North-South researchers in the JACS WAF therefore focused on a third regional synthesis theme during Phase 2 of the programme: *Institutions, Public Space and Conflicts* (see Chapter 4 in the present volume). In parallel, small development projects related to some of the research projects were implemented (Table 1).

Table 1

PAMS	Location and duration	Main outcomes
Water supply delivery to the underprivileged neighbourhood of Yaosehi in Abidjan	Yaosehi, Yopougon, Abidjan, Côte d'Ivoire (September 2002 – October 2002)	Community water tap built; community-based committee created and trained for equitable management of the system
Local capacity-building for protection of lagoon water in a peri-urban village	Azito, Yopougon, Abidjan, Côte d'Ivoire (January 2003 – December 2003)	Joint training in water and environmental analysis for numerous laboratory technicians and researchers in Côte d'Ivoire; demonstrations performed by laboratory technicians for various social groups; construction of latrines and waste management infrastructure; delivery of material for sanitation and cleaning of the shore
Psycho-social, medical and nutritional care for poor people living with HIV/AIDS in deprived neighbourhoods	Yopougon, Abidjan, Côte d'Ivoire (September 2002 – October 2003)	Identification of and consultation with numerous infected women; purchase of necessary prescription medication for several women in need; psycho-social and nutritional assistance for sick people
Innovative tuberculosis treatment actions for nomadic pastoralists in remote zones of Mauritania	Bassiknou, Mauritania (December 2003 – November 2004)	Improved knowledge of therapeutic options among nomadic pastoralists; inclusion of nomadic representatives in village health committees; 30% increase in detection of tuberculosis suspects from nomadic communities in comparison to previous years; first patients have started successful treatment with new approach
Building capacity for preventing pollution of irrigation water	Ouagadougou, Burkina Faso (May 2004 – April 2005)	All stakeholders working in the domains of water, sanitation, health and environment informed about persistent organic pollutants (POPs) and chemical pollution risks in water and soils; the population (gardeners, farmers, horticulturists, municipalities, etc.) informed about various diseases they might contract due to polluted wastewater
Integration of a geographic information system (GIS) in the urban waste management and public health services information system	Ouagadougou, Burkina Faso (January 2005 – December 2005)	Information and sensitisation of professionals from the involved disciplines (sociologists, epidemiologists, doctors, geographers, urban planners), as well as of affected populations, via their associations and NGOs with local competence in the area of urban health and GIS tools; validation of a prototype with participants well informed about the potentials and pitfalls of GIS tools
Regional collaboration for prevention of HIV/AIDS in Nouakchott, Mauritania	Nouakchott, Mauritania (January 2007 – December 2007)	Dozens of participants benefited from regional exchange through one Autodidactic Learning for Sustainability (ALS) workshop; access for hundreds of young men and women to reliable information on sexuality and HIV/AIDS; main indicators of progress showed quantifiable satisfactory results; community relays (group for combating AIDS in colleges, association for combating AIDS among women in the district, care and support group) set up and supported
Strengthening local stakeholders' capacities to improve faecal sludge management	Ouahigouya, Burkina Faso	Promotion of mechanisms for service provision to the most vulnerable segments of Ouahigouya's population; training of stakeholders in the use of tools for monitoring and evaluating combined collection of faecal sludge (manual and mechanical emptiers); promotion of a new faecal sludge management strategy

Main outcomes of the Partnership Actions for Mitigating Syndromes (PAMS) implemented in West Africa during Phases 1 and 2 of the Swiss National Centre of Competence in Research (NCCR) North-South programme.

## 1.2 Outputs: activities, outcomes, integration

Chapters 2, 3 and 4 in the present volume highlight the main scientific outputs and the new evidence generated, which are summarised in Table 2 and briefly commented below. Furthermore, the various studies generated valuable transnational knowledge.

Table 2

	<b>Vulnerability and resilience (see Chapter 2)</b>	<b>Risk assessment and equity effectiveness (see Chapter 3)</b>	<b>Institutions, public space and conflicts (see Chapter 4)</b>
<b>Main scientific outputs</b>	<ul style="list-style-type: none"> <li>– Conceptual framework linking vulnerability and resilience</li> <li>– Specific vulnerability of women living with HIV</li> <li>– Links between lack of education and sexual activity</li> <li>– Acute vulnerability according to national poverty indicators</li> </ul>	<ul style="list-style-type: none"> <li>– New conceptual framework for the improvement of health and environmental sanitation</li> <li>– Appropriate treatment technologies and management framework for wastewater and faecal sludge in Southern contexts (vertical-flow constructed wetlands vegetated with indigenous plants, use of solar radiation, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>– Strong opposition between some population groups, rooted in colonial times</li> <li>– Local rules dismantled and lack of clear authority</li> <li>– The concept of autochthony as an instrument used by actors to serve their interests</li> <li>– Public spaces as places of protest and contestation; shared and disputed places</li> </ul>
<b>New evidence generated</b>	<ul style="list-style-type: none"> <li>– Vulnerability of people living near polluted lagoon waters exposed to bad odours and other bacterial and chemical contamination</li> <li>– Great economic burden of malaria, increasing vulnerability of people living on less than USD 1 per person per day</li> </ul>	<ul style="list-style-type: none"> <li>– Household water conservation techniques to reduce diseases</li> <li>– People's knowledge and behaviour as a driving force to reduce vulnerability to risk</li> </ul>	<ul style="list-style-type: none"> <li>– Resource boundaries no longer clearly defined, specific population groups easily cross borders to exploit pockets of resources on both sides</li> <li>– Local population often resorts to violence to claim their exclusive rights to resources and take advantage of the elasticity of the notion of citizenship</li> </ul>
<b>Main transnational knowledge generated</b>	<ul style="list-style-type: none"> <li>– Widespread absence of basic urban public services (water, sanitation and health) throughout the entire region is an important factor with regard to vulnerability</li> <li>– The fight against HIV/AIDS requires innovative approaches such as Autodidactic Learning for Sustainability (ALS), to be promoted at the regional level</li> </ul>	<ul style="list-style-type: none"> <li>– The reuse of biosolids in peri-urban and urban agriculture can help to increase food security</li> <li>– New approach needed to improve access of nomadic populations to combined services</li> <li>– New wastewater and faecal sludge treatment options that consider nutrient recovery and waste reuse</li> </ul>	<ul style="list-style-type: none"> <li>– Fearing loss of control over their own land and feeling excluded from resources by powerful 'outsiders', local people tend to develop animosity towards other social groups, even when these are citizens of the same country</li> </ul>

Overview of the main results and outputs from the three syntheses conducted in the Joint Area of Case Studies (JACS) West Africa covering the period of 2001–2009. Each synthesis is presented in one of the three following chapters of the present volume.

### **1.2.1 Main findings on vulnerability and resilience**

The specific vulnerability of women living with HIV in Côte d'Ivoire increases if their serological status is known by their friends or family members. Lack of education, as well as participation in sexual activity, are increasing the vulnerability of adolescents to HIV in Chad. In Mauritania, more than 65% of the households investigated in some poor urban areas face acute vulnerability according to national poverty indicators. The vulnerability of people who live near polluted lagoon waters and are exposed to bad odours and other bacterial and chemical contaminations is increasing the burden of diseases. The vulnerability of urban and peri-urban home gardeners is linked to land insecurity and associated health risks; and the great economic burden of malaria is increasing the vulnerability of people living on less than USD 1 per person per day.

### **1.2.2 Main findings on risks and equity effectiveness**

A new conceptual framework was developed to improve health and environmental sanitation using an approach combining health, environmental, socio-economic and cultural assessments in urban and peri-urban areas in developing countries, based on the interrelations between environmental systems, health status and well-being. Wastewater treatment options and household water conservation techniques to reduce diseases were designed and tested, but their adoption depends to a large extent on people's knowledge and behaviour. These are important driving forces in reducing people's vulnerability to risk. An example of success in finding adapted technical solutions for wastewater treatment is research conducted on experimental vertical-flow constructed wetlands vegetated with indigenous plants: this research revealed that *Echinochloa pyramidalis* (antelope grass) and *Cyperus papyrus* (papyrus) were not significantly affected when loaded with faecal sludge at concentrations of up to 200 kg solid matter per m<sup>2</sup> per year (see Chapter 3 in the present volume; Figure 1).

### **1.2.3 Main findings on institutions, public space and conflicts**

There is strong opposition between different social groups, rooted in colonial times and motivated by the need to safeguard ancestral land or their resources in general (see Chapter 4 in the present volume). While local rules have been dismantled, the new bureaucratic institutions that replaced them failed to put in place mechanisms of management, monitoring and fining,

Fig. 1  
Visit of the  
Yaoundé experi-  
mental plant for  
faecal sludge  
treatment by a  
delegation from  
Cameroon's Minis-  
try of Water and  
Energy and local  
authorities during  
the UN Internation-  
al Year of Sanitation  
(2008). (Photo by  
Ives M.Kengne)



thus confirming the lack of a clear authority at all levels in most West African states. In a context of natural resource scarcity, the concept of ‘autochthony’ is used as an instrument by actors to serve their own interests. Resource boundaries are no longer clearly defined, and some people easily cross transnational borders to exploit pockets of resources on both sides. Moreover, public spaces in urban contexts are shared and disputed places where various actors defend their interests (Figure 2). Local populations often resort to violence to claim their exclusive rights over resources in urban and rural contexts, and take advantage of the elasticity of the notion of citizenship (see Chapter 4 in the present volume).

### 1.3 Outlook: challenges ahead, responses and opportunities

The widespread absence throughout the entire region of basic urban public services such as water, sanitation and health is an important factor increasing people’s vulnerability. The fight against HIV/AIDS requires innovative approaches such as Autodidactic Learning for Sustainability (ALS) (Bachmann 2003; Kläy and Vasco Mutimucuo 2007) to be promoted at the regional level (Figure 3). The reuse of biosolids in peri-urban and urban agriculture





Fig. 2  
Transformation of  
pastoral produc-  
tion systems:  
urban pastoralism  
in Nouakchott,  
Mauritania.  
(Photo by Patricia  
Schwärzler)

can contribute to increased food security in many West African countries. A new approach aiming to improve nomadic populations' access to combined services was developed in response to the absence of infrastructure and markets in the region and needs to be further implemented. New wastewater and faecal sludge treatment options that take account of nutrient recovery and waste reuse were developed for regional contexts and are available for implementation. Finally, there is a need for political action to confront the fact that local people tend to develop animosity against other social groups, even when these are citizens of the same country, because they fear losing control over their own land and feel excluded from resources by powerful 'outsiders'.

In future, there is a need to address the following research and research-cum-action questions related to the three themes investigated in the JACS WAF:

- How can HIV/AIDS and malaria be better managed, considering vulnerability and resilience at the household level? What are the different interpretations of the illness *palu* at the regional level, and how do they compare? What are the links between vulnerability and resilience, bad governance, and institutional weakness?



Fig. 3  
A mural painted in  
2003 during a pre-  
vention campaign  
in N'Djamena,  
Chad. (Photo by  
Abdias Nodjiadjim  
Laoubaou)

- What action-research projects should be implemented with a view to combining food quality, food security and the food production system? How can the World Health Organisation's Directly Observed Treatment Short-course (DOTS) approach to combating tuberculosis be better adapted to mobile pastoralists? How can adequate integration of health planning with other social service sectors (education, animal health and environment) be ensured?
- How can multilevel institutional frameworks be implemented to improve the livelihoods of people, indirectly improve their access to basic social services, and enhance social dialogue? How can more support be given to scientific research to help bridge the gap between state policies and groups of actors such as traditional authorities, local or regional governments, civil society, and domestic and global actors?

We expect that these questions, among many others, may be addressed in the third phase of the NCCR North-South programme (2009–2013) by a number of researchers who will work from a disciplinary perspective, with periods of interdisciplinary and transdisciplinary activities, with a view to ensuring effective integration of their research and having a meaningful impact on institutions, individuals and communities.

## Endnotes

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<sup>2</sup> The NCCR North-South is based on research partnerships with researchers and research institutions in the South and East. These partnership regions are called JACS (Joint Areas of Case Studies). Regional Coordination Offices (RCOs) were established in each of these JACS at the outset of the programme. The original function of the RCOs was to coordinate research; in the third phase of the programme, RCOs will consolidate the existing research network in the South and will become hubs for generating new research projects and partnerships.

<sup>3</sup> Partnership Actions for Mitigating Syndromes (PAMS) are projects implemented by local actors together with scientific and non-scientific stakeholders. As a component of the NCCR North-South programme they are designed to implement and validate approaches, methods and tools developed in research, with a view to finding promising strategies and potentials for sustainable development. Moreover, they are intended to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

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## 2 **An Interdisciplinary Vulnerability and Resilience Approach to Health Risks in Underprivileged Urban Contexts in West Africa**

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### **Abstract**

Vulnerability and resilience are very dynamic concepts with links to various processes. In West Africa, the vulnerability of underprivileged groups is aggravated by deficiencies in environmental and health services. Therefore, a vulnerability and resilience approach was taken as a frame of reference for a series of case studies on diseases, environment, poverty, livelihoods, and access to basic social services in urban areas in West Africa. The studies covered various aspects of exposure to different health risks: the sexual practices of schoolchildren in different urban settings in Chad; the social and sexual practices of young women in Ouagadougou in Burkina Faso; responses of women to the AIDS epidemic in Abidjan in Côte d'Ivoire; malaria in a precarious habitat in Abidjan; health problems related to urban agriculture; diseases linked to polluted water in Abidjan in Côte d'Ivoire, Rufisque in Senegal, and Nouakchott in Mauritania; and access to biomedical health care services in Nouakchott in Mauritania. These case studies show that a series of social, environmental, economic and political factors – and their interdependence – make some groups particularly vulnerable to infection; at the same time, these groups have limited options to effectively respond to health risks. In particular, social fragmentation leads to vulnerability with a multidimensional character that includes cultural, social and economic factors. Vulnerable urban populations suffer at several levels. This calls not only for research on urban environments and health issues, but also for processes that strengthen social and personal structures ('empowerment') and foster community mobilisation and social change.

**Keywords:** Vulnerability; resilience; health; urban contexts; West Africa.

## 2.1 Introduction: syndrome studies in urban contexts

Vulnerability and resilience are polysemic concepts developed in various academic fields, as well as in applied and development-related fields, by numerous authors representing different disciplines and approaches (Chambers 1989; Bohle 2001; Beck 2003). Some innovative approaches have combined perspectives on health risks in the natural sciences with perspectives on vulnerability and resilience in the social sciences. The adoption of a conceptual framework of vulnerability and resilience to urban contexts (Moser 1998; Obrist et al 2006) provides some tools for improving the effectiveness of interventions elaborated and applied in the health sphere. The interdisciplinary approaches developed in West Africa within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South have helped to stimulate reflection on the concepts of vulnerability and resilience. In a larger partnership framework, groups of researchers in the region have carried out transdisciplinary consideration of these themes in different West African cities. They provide illustrations of urban centres facing environmental, demographic and socio-economic changes closely interlinked with problems of health and well-being. Studies concentrated on deprived zones in each city where several typical syndromes overlap. The density of syndromes is an important indicator for poverty and vulnerability. People living in disadvantaged urban areas are the populations most exposed to health risks.

By combining expertise from various disciplines (anthropology, geography, environmental sciences, epidemiology, public health, sociology, economy), the group of researchers represented here aimed to contribute to the production and dissemination of knowledge about the stakes of urban health while also developing new practices. The results produced by this interdisciplinary team contributed to further development of both the vulnerability and resilience concepts and tools that can be applied in health interventions. Reflection focusing on these concepts made it possible to enlarge the sphere of action for health policies by including cultural and social factors that are often neglected in analyses narrowly based on quantitative indicators of economic risk or poverty.

Inspired by different models and theories developed in other contexts, our multidisciplinary research team examined the concepts of vulnerability and resilience from the perspective of exposure to health risks in urban settlements, focusing principally on social fragmentation (HIV/AIDS, gender,

sexual and reproductive health), malaria and urban environments (livelihoods, poverty, popular practices, environmental health hazards) and access to urban services (water, sanitation, health facilities). Themes were developed as a product of joint reflection and based on a common view of examining the complex links between health problems and the increasing density of multiple syndromes in disadvantaged urban contexts. Our reflections on vulnerability and resilience to health risks helped us to understand many scientific approaches and yielded interesting results in many fields of investigation. These two concepts constitute the main theoretical focus of the various research teams. They were critically reviewed by various members of the NCCR North-South teams in West Africa. The diversity of the perspectives on which these various contributions focus confirms that vulnerability and resilience are very dynamic concepts linked to various processes. In order to analyse the potentials and the limits of these two concepts, the ideas that were derived from the different approaches are presented and commented on here.

## **2.2 Methods and approaches**

One main focus of the studies was to analyse the links between transformations in urban contexts and their effects on health risks, taking the concepts of vulnerability and resilience as entry points. This is especially pertinent, because the themes (health risks, environmental factors, poverty, livelihoods and social fragmentation) interact at various levels. The different contributors show how these two concepts were integrated into their approaches and analyses to better understand and interpret their research results.

Scientific discourse based on the risk approach was further developed to include vulnerability and resilience. It examines how social groups and individuals exposed to risks are susceptible to vulnerability and how they react to cope with this situation and build resilience. Different authors have used various methods and approaches to define concepts and frameworks with regard to vulnerability and resilience within their own disciplines. The research reported on here draws on definitions and approaches developed by Chambers (1989), Moser (1998), Tanner and Mtasiwa (2001), Obrist and Tanner (2002), Obrist et al (2006), and Obrist (2010), considering vulnerability as a combination of exposure to risks and lack of adequate means to manage them, and resilience as the capacity to react to and manage or even prevent risks and shocks to which households, groups and communities are exposed. The concepts of vulnerability and resilience are relational and reciprocally linked (Obrist et al 2006).

Different dimensions of health and socio-economic aspects were studied in disadvantaged urban areas of Abidjan. Social fragmentation and commoditisation were addressed with an emphasis on social exclusion and access to resources among women living with HIV/AIDS in Abidjan (Kablan et al 2006), cultural and social practices in communication about sexuality between adults and adolescents exposing the latter to risk of HIV infection in N'Djamena (Nodjiadjim et al 2006), and representation of linkages between adolescents' sexual practices and HIV by their grandparents' generation in Ouagadougou (Schwartzler 2010). The two concepts were also applied in three studies involving malaria research in Abidjan, on experiences, meanings and practices in the daily lives of adults touched by the illness locally defined as *palu* (Granado et al 2006); an evaluation of the economic burden of malaria (Kouadio et al 2006); and the main problems of urban agriculture (Matthys et al 2006). Different aspects of poverty and access to resources (Bâ et al 2004) were investigated in Nouakchott. Other studies focused on health risks due to pollution of the urban environment and access to urban social services from the perspective of vulnerability and resilience, such as access to drinking water, solid waste evacuation, sanitation management, and capacity to react to crises in the urban contexts of Rufisque (Sy 2006), Abidjan (Koné et al 2006) and Nouakchott (Diop et al 2004; Koita et al 2004), and access to health facilities in Nouakchott (Keita et al 2004; Ould Taleb et al 2006).

Various sources of information, methods and analytical tools were applied and combined in our studies of vulnerability and resilience. The research approaches were both quantitative and qualitative. Quantitative information was collected in household surveys using questionnaires with various headings relating to vulnerability and resilience. Qualitative data were collected through in-depth interviews and focus group discussions, with interview guidelines targeting individuals as well as institutional, political and community actors.

### **2.3 Results**

From a great number of rewarding contributions, it was possible to capitalise on many of the results derived from approaches using these concepts or conceptual frameworks. We decided to present only a selection of the most important ones here. The contributions in this article are organised around three orientations of the vulnerability and resilience concepts.



The first category of results shows that in urban areas, health risks are often aggravated by social fragmentation. Vulnerability associated with women infected with HIV/AIDS is translated into a break-up of social and marital ties after they share their serological status with their kin and friends and consequently experience the difficulty of finding a means of livelihood (Kablan et al 2006). Two further studies in N'Djamena and Ouagadougou showed that socio-cultural norms and values have a determining influence on the sexual practices of adolescents that put them at high risk of contracting HIV (Nodjiadjim et al 2006; Schwärzler 2010). In these three settings, these phenomena are worsened by many different factors: lack of communication, be it with HIV-positive persons or between parents and children; lack of sexual education of adolescents, who seek information among peers or in the media and succumb to peer pressure to prove sexual activity, especially when girls have sexual relationships with older men for commodities; isolation of people living with HIV; and dissociation from people thought to be contaminated. Vulnerability of HIV-infected persons or adolescents is linked with lack of education, leading to a scarceness of resources for coping with the problem. Thus social fragmentation leads to vulnerability with a multidimensional character, including cultural, social and economic factors.

The second category of results demonstrates that health risks are linked to poverty, livelihoods and environmental contexts. Poverty is one of the reasons for the development of urban agriculture as a source of livelihood. This environmental context is one of the driving factors in vulnerability to health risks. The results of a study conducted in Abidjan link the vulnerability of market gardeners to insecurity of land ownership and to marketing difficulties (Matthys et al 2006). Health problems are related not only to weariness and sanitation problems, but other preoccupations of daily subsistence. In analyses of malaria in precarious urban areas, a close link was found between environmental risks, which are cited as factors in urban vulnerability among other assigned causes of malaria, and the locally defined illness *palu* (Granado et al 2006). Thus, risks of malaria contamination are factors in vulnerability directly linked to the environment of a city undergoing uncontrolled urbanisation. People living in disadvantaged areas are the most exposed and the most continuously exposed to risk of malaria. Their capacity to react to this risk is associated with resilience. From the population's point of view, commoditisation opens resilience pathways, and actors can choose between different medicines to treat malaria. Commoditisation is also a major cost factor in the management of the illness. In urban areas, availability and geographical accessibility often are not a problem. Rather, vulnerability is relat-

ed to problems of equity effectiveness. On the other hand, the commoditisation of drugs offers a possibility to face urban vulnerability induced by environmental risks and to fight the illness. Observations related to the economic burden of the disease and poverty in urban households in Abidjan (Kouadio et al 2006) revealed that malaria is a very great burden for financially weak households. The economic pressure linked to this disease is even greater for people living on less than USD 1 per person per day. In this context vulnerability is a matter of the significance of economic risks linked to malaria and the fragility of the economic power and social potentialities of a household. Social capital in terms of 'belonging to social networks' is less important than expected. Vulnerability grows when people make use of different medical options without considering cost-effectiveness or co-efficacy. The impact of a disease on economic vulnerability is confirmed by an analysis of the socio-economic conditions in precarious districts of Nouakchott which indicates that more than 65% of the households are in a situation of acute vulnerability according to national poverty indicators (Bâ et al 2004).

The third category of results concerns access to urban services (water, sanitation, health) and the consequences with regard to the propagation of diseases. A study carried out in Abidjan (Koné et al 2006) on the effects of lagoon pollution on peri-urban populations living at the seashore shows aspects of vulnerability related to bad odours emanating from polluted water, to increase of bacteria, and to flies and mosquitoes as vectors of diseases such as cholera, diarrhoea, malaria, and others. Aspects of resilience are related to initiatives undertaken by individuals for maintenance of the lagoon shores and to the financial, human and social capital of households where episodes of illness occur. Other studies in Nouakchott and Rufisque on the frequency of diseases such as malaria, acute respiratory infections and diarrhoeic diseases (Koita et al 2004; Sy 2006), or on environmental risks such as lack of drinking water or absence of appropriate systems for waste removal (Diop et al 2004; Sy 2006), illustrate the consequences of vulnerability linked to health risks, lack of hygiene and environmental sanitation in urban areas. The absence of basic city services needed for urban management is an important factor in a population's vulnerability. Vulnerability grows with increasing spatial and social discrimination. The most striking example of resilience is the reactive capacity of a population leading to self-governance in sanitation. In the study areas, even in urban settings, populations still have very limited access to health facilities and basic social services. Populations in Abidjan, Nouakchott and Rufisque consider that they are exposed to numerous health risks and that they have difficulty accessing modern health care services when illness occurs. This is

aggravated by the insufficiencies of these services. The reasons put forward by inhabitants of disadvantaged urban neighbourhoods range from geographical and financial to social and cultural factors. Thus, disease episodes are managed with the support of numerous networks – be they familial, ethnic, associative or professional – which manifest through group solidarity.

The results of these studies are also interesting with regard to the numerous scientific implications of their findings, which lead to important new perspectives and lines of further inquiry and application. Only the most important studies have been chosen here to demonstrate the specificities of a given context or potentials for generalisation.

Social networks such as associations of people living with AIDS should be carefully examined in terms of benefits for the leaders and the members, and in terms of relations with the government and other non-governmental organisations and community-based organisations (Kablan et al 2006). As sexual practices are closely linked to cultural, social and religious norms and values, preventive strategies against HIV/AIDS should always be adapted to the respective context and target specific age and gender groups (Nodjiadjim et al 2006; Schwärzler 2010). Comparative studies should be conducted on associations of persons living with HIV/AIDS in other regional contexts and on associations of people with other diseases (Kablan et al 2006).

Analyses of the implications of poverty, livelihoods and environmental contexts show that urban malaria is different from rural malaria, and that urban malaria in adults differs from malaria in under-fives (Granado et al 2006). Moreover, malaria is overestimated in urban areas due to inflated perceptions. The vulnerability approach in health economics makes it possible to explain the links between economic insecurity – both resulting from and causing disease – and scarce livelihood resources (Kouadio et al 2006). New lines of inquiry for research could be multi-level analyses of home management of urban malaria, comparative studies of the local interpretation of *palu* with other interpretations of urban vulnerability (stress, nerves), or more in-depth studies on the process of appropriation in a historical perspective. Study of the social vulnerability to malaria risk would be especially important in urban contexts (Granado et al 2006). To reduce vulnerability in the economic sphere, future studies should try to develop an econometric model of the factors influencing vulnerability (risk and capability), and co-efficacy studies should identify pathways to resilience in urban settings for equity effectiveness (Kouadio et al 2006).

The studies that applied the vulnerability approach to access to social urban services illustrate that small geographic units allow for a better understanding of pathogenic systems in heterogeneous urban contexts (Koné et al 2006; Sy 2006). Also, combined approaches yield the best results for disease incidences in urban areas, and longitudinal approaches are more valid than transversal ones (Sy 2006). In disadvantaged areas, the results make it possible to gain new perspectives on the organisation of health systems (Keita et al 2004; Ould Taleb et al 2006). Future studies should investigate whether sanitation governance is the best solution to improve management practices and hygiene in urban areas (Koné et al 2006; Sy 2006). Given the wide range of water and environmental sanitation problems in urban areas, the approaches of risk perception, vulnerability and resilience can be further deepened and enriched (Sy 2006). It would be interesting to explore the reactive capacities of populations with respect to sustainability and to helping them increase effectiveness (Keita et al 2004; Ould Taleb et al 2006).

## **2.4 Potentials and limits of the two concepts**

The concepts of vulnerability and resilience generate some focal points for scientific evaluation and political negotiation, leading to locally appropriated and adapted public health actions that are more than simple interventions because they also initiate processes of transformation (Obrist 2006). These concepts provide a framework not only for establishing values and objectives in development processes, but also for evaluating impacts and directing actions (Obrist and Wyss 2006). By using different entry points and approaches, the authors of these studies showed that vulnerability and resilience are polyvalent concepts that allow different disciplines to deal with transversal topics concerned with several aspects of urban health. Vulnerability is most often conceived as being constituted by components that include exposure to risks or perturbations and the capacity to adapt. Resilience is conceived as the ability of groups or communities to cope with external hazards as a result of social, economic and environmental change. In explaining the capacity to respond or to adapt, the different approaches show the ability of groups or communities to adjust to health risks, to moderate potential damage, to take advantage of opportunities, or to cope with negative consequences (Gallopín 2006).

The diverse orientations of these approaches and definitions, as well as the pertinence of these concepts, show the great potential they have as a basis

for pursuing interesting new topics in the field of urban health. A conceptual framework addressing questions of vulnerability and resilience from several angles allows new research questions to be generated and provides a deeper understanding of urban health problems. Based on a series of case studies in West Africa, this paper argues that new starting points and innovative concepts arise by linking vulnerability and resilience approaches, especially those focusing on access to basic services such as health, education, water, sanitation, decent habitation, and others. Urbanisation will remain a challenge in the coming years and will continue to have important implications for the health of city dwellers (Obrist et al 2006). The links between urbanisation, poverty, environment and health will continue to constitute a particular interest and a major challenge for research (Kjellstrom et al 2007).

One noteworthy limitation of the vulnerability and resilience concepts is that they are not geared to action. Moreover, regarding the nature of the approaches, vulnerability is considered as a negative property, especially in the economic, environmental and sanitary domains. In cases where change leads to a beneficial transformation, such as the emergence of a given social group, and where it becomes a window of opportunity for improvement of health systems, it is possible to speak of positive vulnerability (Gallopín 2006). With reference to the progressing epidemiological transition and the dual burden in many developing countries of both infectious and chronic diseases, it is important to direct research on urban health towards approaches that allow examination of vulnerability and resilience with a broader understanding, and that recommend concrete solutions to the problems faced by populations in their communities. Investigation of the effects of social change and transformation on health systems requires interdisciplinary collaboration among social and natural scientists and could be an appropriate item in a research agenda on syndromes of urbanisation and global change.

## **2.5 Conclusion**

Application of the vulnerability and resilience concepts in various studies in West Africa resulted in dual enrichment, at both the conceptual and the methodological levels. The studies, which considered the two interrelated concepts of vulnerability and resilience, have made it possible to explore the risks to which populations are exposed in a more integrated way and from different angles, and to analyse the effectiveness of solutions for coping with them. The various approaches applied in our studies allow for generation

of a scientific basis to develop and validate adapted, efficient and innovative strategies in health planning and health interventions that will improve health and well-being in disadvantaged urban and peri-urban areas. The frequently very theoretical research results on vulnerability and resilience would gain importance if they could be followed by and/or linked to concrete, effective and equitable implementation dynamics.

## Endnotes

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### 3 **From Risk Management to Equity Effectiveness in Environmental Sanitation and Health in Africa**

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#### **Abstract**

Achieving the MDGs in water and sanitation as well as in food and nutrition in developing countries will require new strategies. Among other things, this implies 1) accurate diagnosis of problems and their consequences; 2) a variety of solutions adapted to the realities of heterogeneity and complexity in the target context; 3) revision of the implementation process for solutions. Research was carried out in West and Central Africa with the aim of developing innovative approaches and hypotheses for equitable management of health and sanitation risks among neglected populations. Classical methods of social science (epidemiological household surveys, focus groups, stakeholder analysis, contingent valuation method, psycho-social modeling), methods from the biological and chemical sciences (serological testing, physico-chemical and parasitological analyses) and pilot-scale experiments were used to address specific questions related to the improvement of environmental sanitation in urban areas and to the well-being of nomadic pastoralists. Results indicated that anarchic wastewater discharge due to poor and inadequate infrastructure, people's knowledge and behaviour, their willingness to improve, the 'one medicine concept', and implementation of low-cost technologies such as vertical-flow constructed wetlands for wastewater and faecal sludge treatment are factors to focus on when trying to reduce vulnerability to risk. Equity effectiveness in environmental sanitation calls for a transdisciplinary approach combining health, environmental, socio-economic and cultural aspects.

**Keywords:** Africa; equity effectiveness; health; pollution; sanitation; risk management.

### **3.1 State of the art and problem setting**

Lack of health and sanitation services is a major cause of suffering and death for millions of children and their families. Every year between two and three million people die because of inadequate sanitation, insufficient hygiene and contaminated food and water. A contaminated environment puts people at obvious risk of exposure to pathogens, harmful organisms that lead to infection and disease. Those most affected are poor people, children, and people living on marginal rural land and in urban slums (Esrey et al 1991). An evaluation of waste management practices in most African countries reveals that the main shortcomings relate to the widespread lack of planning and management capacity in municipalities, a paucity of effective legal provisions and organisation, the absence of stakeholder coordination, and the lack of affordable treatment options (Koné and Strauss 2004; Dongo 2006; Koanda 2006; Kengne 2008). This situation is responsible for increasing malnutrition and disease, loss of biodiversity and agricultural production, and reduced economic growth and social stability, sometimes leading to conflicts over water resources (Koné et al 2006; Fokou 2008).

In Africa, liquid and solid waste management practices are more at odds with safeguarding the environment and with the principle of sustainable development than in industrialised countries. For instance, faecal sludge emptied manually or mechanically from on-site sanitation devices is most often discharged without treatment whatsoever (Figure 1). Such practices have disastrous effects in the short and long term on health and health conditions, as well as on soil and other resources (Feachem et al 1983; Koné and Strauss 2004). The situation is particularly critical in cities where high population density causes concentration of wastes, further complicating the situation. Despite concerted efforts to provide adequate latrines and sewers, sanitation needs are only rarely met in a satisfactory way. The pace of urbanisation continues to outstrip the capacities of urban authorities to manage and control it. Many cities have adopted conventional systems, but this single technological choice has most often proven inappropriate due to inadequate design and high operating and maintenance costs (Koné 2002). Where this service exists, only small segments of the population have access to it, and it often functions intermittently. Top-down planning has failed to produce tangible and sustainable improvements for either the population or the environment (Zurbrügg et al 2004). There are still knowledge gaps concerning the driving forces (technical and socio-economic alternatives) that could solve these problems.



Fig. 1  
Anarchic discharge  
of faecal sludge  
from on-site sani-  
tation systems in  
Cameroon. (Photo  
by Ives M. Kengne)

Great development disparities are apparent in semi-arid, peri-urban and urban areas in most developing countries, especially those located south of the Sahara. Indeed, in semi-arid areas, populations made up mainly of nomadic pastoralists are threatened by natural hazards such as repeated drought (almost every ten years), poor soils, inadequate rainfall, and scarcity of human and animal food resources. They are also vulnerable owing to a lack of access to drinking water, a lack of social services such as health care and education, and a lack of security of people and goods.

New strategies are needed to achieve the MDGs in water and sanitation, as well as in food and nutrition, in urban, peri-urban and semi-arid areas. Among other things, this implies accurate diagnosis of problems and their consequences, finding a variety of solutions adapted to the realities of heterogeneity and complexity in the target context, and revision of the implementation process for solutions. The main challenge for research carried out in West Africa was therefore to come up with innovative approaches and hypotheses for managing health and sanitation risks and providing sanitation and health equitably to neglected populations. The case studies carried out in West Africa within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme focused on raising awareness and finding sustainable solutions to ameliorate the sanitation situations and the livelihoods of city dwellers and nomadic pastoralists, thereby reducing their vulnerability to environmental sanitation and health risks.

## **3.2 Methods and approaches**

The approaches and methods used were based on an integration of classical methods developed in the natural and/or social sciences, participatory methods, and appropriate low-cost and low-input interventions developed together with actors.

### **3.2.1 Approaches for assessing health status and risk management in urban contexts**

The methodology for assessing the status of health in urban contexts was based on epidemiological surveys and focus groups. This was complemented by laboratory analysis using standard methods commonly applied to analyse blood and wastewater treatment (Koné 2008). A geographical information system (GIS) was used to map health risks linked to livelihood, pollution, and people's practices and perceptions (Dongo 2006).

With respect to risk management, this diagnosis of health status was complemented by technology development. To this effect, experiments were conducted at yard- or pilot-scale plants to test low-cost and effective methods of wastewater and faecal sludge treatment, as the region enjoys tropical climatic conditions with good solar radiation throughout the year. These climatic conditions are favourable for the biological reactions that govern most of the processes involved in the eco-technologies tested (Kenfack 2006).

Finally, in the case studies in Ouahigouya (Burkina Faso), multi-stakeholder analysis was developed as an innovative strategic planning approach for sustainable faecal sludge management in urban areas to minimise public health and environmental risks (Koanda 2006). Stakeholder analysis, techniques for involving stakeholders, contingent valuation methods and a psycho-sociological model were used to develop a reproducible methodology for stakeholder analysis and involvement, in order to enhance awareness about improved faecal sludge disposal.

### **3.2.2 From risk management to equity effectiveness**

Threats faced by poor populations are complex and should be tackled in a holistic manner. Accordingly, a new conceptual framework for the improvement of health and environmental sanitation, using an approach combining health, environmental, socio-economic and cultural assessments in urban

and peri-urban areas in developing countries, was developed based on the interrelations between environmental systems, health status and well-being in a particular area of interest (Nguyen Viet et al 2009).

In the semi-arid and peri-urban contexts, epidemiological surveys, serological testing and molecular biological methods were used to assess the level of different zoonotic diseases. Sociological and cultural methods, as well as economic assessments, were used to assess the health and well-being of populations, especially in Chad and Mali (Zinsstag et al 2007).

### **3.3 Results**

#### **3.3.1 Disease prevalence and the sanitation situation in urban contexts**

Disease prevalence in most of the cities is associated with the level of sanitation and hygiene.

The working environment, waste dumps, and human defecation grounds were the main health risks. It was found in Abidjan that household water conservation techniques are one area in which action could be taken to reduce the prevalence of diarrhoea (Koné 2008). In urban and peri-urban areas, there is a link between urbanisation levels and malaria (Koné 2006). Human activity affects the nature of breeding sites, and the vector adapts to environmental change. Anarchic wastewater discharge due to poor and inadequate infrastructure, as well as people's knowledge and behaviour, are the driving forces on which action can be taken to reduce the population's vulnerability (Dongo 2006; Koné et al 2006).

#### **3.3.2 Vertical-flow constructed wetlands and solar radiation: Low-cost options for faecal sludge and wastewater treatment in developing countries**

Vertical-flow constructed wetlands with indigenous plants and Advanced Oxidation Processes (AOPs) are very promising technologies that could be used in developing countries to tackle the treatment of faecal sludge and contaminated wastewater containing non-biodegradable organic pollutants. Results gathered in yard-scale experiments in Cameroon revealed that the indigenous plant *Echinochloa pyramidalis* (antelope grass) was not sig-

nificantly affected when loaded with faecal sludge at concentrations up to 200 kg of solid matter/m<sup>2</sup>/year (Kengne et al 2008). Despite the high solid loading rates applied, the system performed relatively well for solids, nutrients and organics, with pollutant removal efficiencies greater than 80% for most parameters considered. Furthermore, the system generated large quantities of biosolids rich in nutrients for agriculture and generated high amounts of forage biomass when operated at full scale (Kengne et al 2006). The reuse of biosolids in peri-urban and urban agriculture can help to increase food security.

For the first time, a study of potential application in the field of helio-photocatalysis was explored in a sub-Saharan Africa country (Burkina Faso), profiting from the significant solar radiation in that country (Kenfack 2006). Use of this system also led to reduction of the organic content of sewage. However, studies are still needed to determine a good indicator that could confirm the biodegradability of the photo-treated effluent.

### **3.3.3 Stakeholder analysis as a new planning method for faecal sludge management**

The stakeholder planning approach developed in Ouahigouya, relying on a combination of stakeholder identification and analysis and participatory planning techniques, appeared to be an efficient method for faecal sludge management in developing countries. Willingness to improve it depends greatly on psycho-sociological factors such as attitudes about and beliefs in an improved neighbourhood environment, social pressure on households from the neighbourhood, and the subjective costs and benefits of improved faecal sludge management. These factors are therefore levers that planners and decision-makers can use to encourage, increase and develop the demand for improved latrine emptying services, e.g. through social marketing. Research led to the development of decision support tools for professionals and policy-makers. These tools facilitate the development of a tariff-oriented policy to avoid uncontrolled faecal sludge discharge into the environment and to render investments by private operators profitable, while still making emptying services accessible to low-income households (Koanda 2006).

### **3.3.4 Improving the livelihoods of nomadic pastoralists**

In semi-arid contexts, improvements in milk production led to increased income and pathogen load reduction. This allows micro-finance and farmer organisations to play a significant role in fostering this quality improvement.



In countries where there is lack of access to and lack of provision of health services, such as Chad and Mali, extreme dispersion of populations is a handicap. In the case of some zoonotic diseases (brucellosis, Q-fever, rabies) there are links between humans and animals. Furthermore, there is an absence of infrastructure and markets for improving access to combined services (Zinsstag et al 2007). Appropriate measures could thus be taken to improve the health status of nomadic pastoralists. This could be done by applying the concept of 'one medicine'. In Chad, for example, control of brucellosis and rabies was shown to be profitable and cost-effective for human health.

### **3.3.5 Conceptual approach for equity effectiveness in health and environmental sanitation**

To understand the links between health and environmental sanitation more comprehensively, and to identify the most efficient and equity-effective interventions for reducing the disease burden, the conceptual framework developed for the improvement of health and environmental sanitation in urban and peri-urban areas of developing countries was based on an approach combining health, ecological, social, economic and cultural assessments (Nguyen Viet et al 2009). The framework has three main components: health status, physical environment, and socio-economic and cultural environment.

Information on each of these three components can be obtained by using standard disciplinary methods as well as an innovative combination of these methods. In this way analyses will lead to extended characterisation of health, ecological and social risks, while allowing the comprehensive identification of critical control points (CCPs) in relation to biomedical, epidemiological, ecological, socio-economic and cultural factors. The proposed concept complements the conventional CCP approach by including an actor perspective. The actor perspective considers vulnerability to risk and patterns of resilience. Interventions deriving from the comprehensive analysis consider biomedical, engineering and social science perspectives or a combination of these. In this way the proposed framework can jointly address health and environmental sanitation improvements as well as recovery and reuse of natural resources. Moreover, interventions encompass not only technical solutions (safety, sanitation) but also behavioural, social and institutional changes derived from the identified resilience patterns. The interventions are assessed in terms of their potential to eliminate or reduce specific risk factors, and also to reduce vulnerability, enhance health status and assure equity. The key methods proposed are Quantitative Microbial

Risk Assessment (QMRA), Epidemiology, Material Flow Analysis (MFA) and Social Science Assessment (SSA) (Figure 2).

Initially, the framework was conceived and validated for the context of urban and peri-urban settings in developing countries, focusing on wastes such as excreta, wastewater and solid waste, their influence on food quality, and their related pathogens, nutrients and chemical pollutants. We are currently testing this framework in three case studies in Southeast Asia (Vietnam and Thailand) and in West Africa. In Abidjan, a QMRA study on infection risk focusing on exposure to wastewater discharged in a canal has already shown that annual infection risks from involuntary ingestion of canal water at different points and with different activities, in particular collecting and cleaning solid wastes (e.g. plastic bags) in the canal, were largely higher than acceptable risks as defined by WHO. An MFA study has looked at wastewater management in the same area and identified on-site sanitation (septic tank and latrines) and drainage as the main contributors of

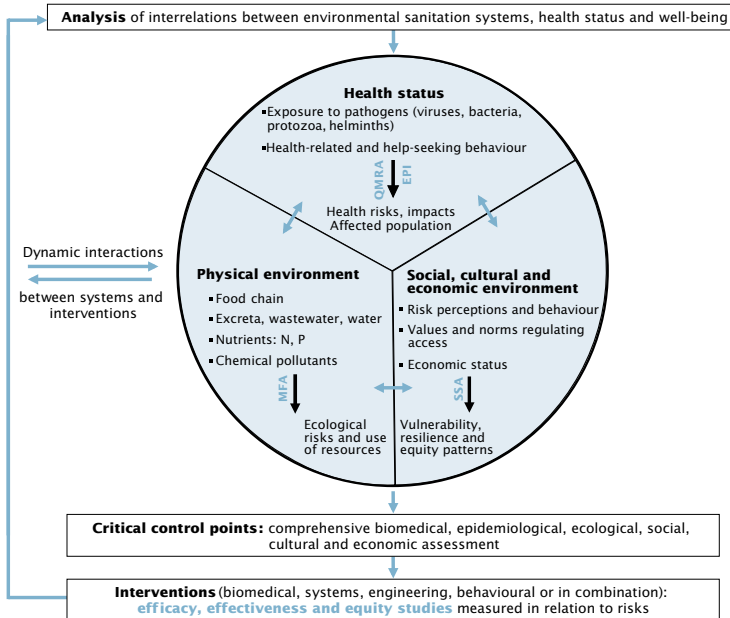


Fig. 2  
Conceptual framework for combining health and environmental risk assessment for Health and Environmental Sanitation Planning. (Based on Nguyen Viet et al 2009)

Blue characters refer to methodologies used within the conceptual framework – EPI: Epidemiology; QMRA: Quantitative Microbial Risk Assessment; MFA: Material Flow Analysis; SSA: Social Science Assessment.

N and P discharge to soils and the lagoon (CCPs). Three scenarios proposing how to treat and reuse waste have been proposed; they have the potential of dramatically reducing the pollution load in the environment. To combine the three components, data collection and assessments still need to be done (Nguyen Viet et al 2009).

### **3.4 Conclusion and perspectives**

The research carried out has yielded promising results for increased mitigation of core problems of global change. These results could be scaled up to a larger scale within the urban context, either to the national or to the regional level.

Indeed, new wastewater and faecal sludge treatment options that consider nutrient recovery and waste reuse are available for regional contexts. But research is still needed to gain acceptance for using biosolids and biomass among local farmers. In addition, composting and the best operational conditions for good performance of the system while producing high forage plants of better quality must be investigated. In poor urban settlements, the social networks formed can be used for improving combined services and for scaling up, but research must be done to seek the best ways of involving excluded stakeholders.

The malaria vector *Anopheles* can be controlled by adapting control measures to the local context, through breeding site management, and by monitoring urban breeding sites. However, there is a need to extend monitoring in the urban environment and to assess the control tools.

In peri-urban and semi-arid contexts, it is possible to combine food quality and food security and production systems. The importance of tuberculosis and selected zoonoses has been highlighted, but adaptations of Directly Observed Treatment, Short-course (DOTS) to the needs of mobile pastoralists are necessary. Moreover, health planning needs to be contextualised and integrated with other social service sectors (education, animal health and environment).

Given the complexity of some environmental concerns in developing countries, new approaches combining multiple scientific disciplines (engineering, epidemiology, social science, and others) and multi-stakeholder involvement must be encouraged.

## Endnotes

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## 4 **Autochthony, Natural Resource Management and Conflicting Rights in West Africa**

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### **Abstract**

Global phenomena such as nationalism, extremism and xenophobia are related today to discourses on autochthony and citizenship. Given current processes of democratisation and economic liberalisation, and the scarcity of natural resources, interaction between people of diverse origins is becoming increasingly violent. In West Africa, the declining resource base and power relations are important factors in conflicts between different communities. Many outbreaks of violence are caused by attempts on the part of 'autochthons' to safeguard 'ancestral lands' against 'newcomers' accused of overusing this patrimony. This seems paradoxical at a time of political and socio-economic change, when official discourse invites national and regional integration. The present article draws on studies carried out in West Africa between 2002 and 2007. Data extracted from various individual studies on institutions concerned with natural resource management, livelihood and territory, and negotiated statehood were compiled, analysed and discussed in two interdisciplinary meetings involving researchers from many scientific backgrounds. Focusing on pastoralism and access to land, this article aims to demonstrate that management institutions are eroded in a context of resource scarcity, and that certain groups build discourse and strategies on fuzzy notions of nationhood or identity in order to exclude other users. In this process, the notion of autochthony appears to be an ideological tool in the hands of native people to express their social malaise and difficulties in sustaining their livelihoods in a context of global development. The article concludes that in a context of 'presence-absence' of the state, negotiations between various stakeholders at different levels could foster sustainable development.

**Keywords:** Autochthony; citizenship; conflicting rights; institutions; public space; West Africa.

## 4.1 Introduction

Tensions and conflicts generated by socio-political crises in West Africa should not be regarded only as ‘popular agitation’ or spontaneous street demonstrations. Conflicts and violence are often fomented by political actors with great bargaining power to enhance their personal position and interests (Richards and Chauveau 2007). Even though the Ivorian crisis is an example of conflict located within a single country, cases such as this should invite scientists to question the political, economic, social and cultural determinants used as a basis for defining citizenship in African states (Bayart et al 2001). In many cases, national citizenship is shaped by encounters between ‘locals’ and ‘non-locals’, or ‘nationals’ and ‘foreigners’. It is challenging to understand how these different constellations contribute to the political, social and economic development of a nation – especially in Africa, a continent characterised by fluidity of borders due to weak state control and cross-border social organisation.<sup>6</sup> Even though national physical boundaries are fixed, social boundaries are still shifting due to artificial foundations of states and an unclear notion of nationhood. Migrants and mobile populations are often animated by the desire to achieve their livelihood goals whatever the conditions and the cost. Opportunistic uses of the notion of citizenship by ‘outsiders’ create many tensions in areas where local people believe that newcomers (pastoralists, migrant workers) have nothing to lose if resources are completely depleted. The autochthony discourse that emerges from these confrontations is rooted in the strategy of local people to safeguard their assets and secure their livelihoods. But it is very often forged by political and economic entrepreneurs for their personal benefit (Socpa 2003). Thus, autochthony has become a strong catalyst for specific actors in building their socio-political personality and also in establishing new ways of accumulating wealth.

This article aims to demonstrate that, in a context of land and resource scarcity, the notion of autochthony leads some actors (autochthons or powerful outsiders) to base their discourses and strategies on a fuzzy notion of nationhood or identity in order to exclude other users (Dozon 2000; Dembélé 2002). Today, there is a growing tendency to exclude alleged ‘strangers’ and unmask ‘fake’ autochthons, who are often citizens of the same nation-state (Socpa 2003; Ceuppens and Geschiere 2005).

Based on the results of several studies carried out in West Africa, this article examines concepts of institutions, public space and conflict, focusing on the

notion of autochthony as the entry point in analysing the dynamics of natural resource management in West Africa. It takes a three-fold approach. Firstly, it focuses on the notion of autochthony, which appears as an ideological tool used by native populations to express their frustration and difficulty in achieving their livelihood goals in territories they consider as theirs, but where the resources bring greater benefit to 'foreigners'. Secondly, it tries to demonstrate that, contrary to the common explanation of conflicts between resource users as the consequence of scarcity (ecological factor), conflicts in West Africa have strong socio-economic and political roots. Thirdly, it shows that rather than excluding people, the notion of autochthony can become a tool of national development when various segments of a population are given real incentives for sustainable management of resources.

The article begins with a review of hotly debated questions of citizenship in Africa in which 'in' and 'out' or inclusion/exclusion dichotomies are very flexible. Based on examples from studies in the semi-arid context of West Africa, it then analyses the question of shifting boundaries marked by rapid institutional transformations, resulting in resource scarcity and outbreaks of violence. Finally, it discusses the stakes of regional integration for sustainable development in a context marked by strengthening of the feeling of belonging.

## **4.2 Methodology**

This article draws on an analytical synthesis of studies carried out in West Africa between 2002 and 2007 within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South and addresses questions of sustainable development. Data presented here are extracted from completed or ongoing studies that have applied various research methods of the social, veterinary and epidemiological sciences. Investigations were conducted in both semi-arid and urban contexts. The main focus of these studies was on livelihood and institutions, with an emphasis on transformations of institutions for natural resource management in wetlands, particularly in the Lake Chad floodplains (Landolt 2003; Fokou 2008); livelihood and territory, with a look at urbanisation, city design and the urban model in West African countries such as Mauritania, Senegal and Côte d'Ivoire (Chenal 2009); and negotiated statehood, with a focus on historical and socio-political perspectives.<sup>7</sup>

Data from empirical results and conceptual analyses in various studies were compiled, analysed and discussed during two interdisciplinary meetings involving researchers from different scientific backgrounds (anthropology, sociology, urban planning, history, political science and veterinary science) in Côte d'Ivoire (September 2007) and Mauritania (March 2008).

## 4.3 Results and discussion

### 4.3.1 The 'in' and the 'out' in African citizenship

Human relationships are always marked by dichotomous categories such as local and non-local, autochthons and *allogènes*, indigenous and foreigners, sedentary and mobile. These categories constitute the determinants of the 'in' and the 'out', or factors relating to inclusion and exclusion in various societies. However, the term 'indigenusness' is unclear and multidimensional. The United Nations and its subsidiary organisations use the term 'indigenous peoples' to characterise ethnic groups of people who inhabit a geographic region with which they have the earliest known historical connection, along with immigrants who have also populated the region and are greater in number (WGIP 2001). Even though many criteria such as territory, race, history, and lifestyle are often mentioned when defining the indigenusness of a given people, the most important are the political role played and access to decision-making arenas. Thus an indigenous group could be considered as a politically underprivileged population group which shares a similar ethnic identity that is different from the one of the nation in power, and which constituted an ethnic entity in the locality before the present ruling nation assumed power. This definition of indigenusness primarily emphasises colonisation or annexation of a minority group by a nation-state or a powerful socio-political group. However, in more restricted terms, indigenous people may be regarded as groups of populations with collective rights in a given territory. This definition is close to the notion of 'autochthonous', derived from Greek and meaning 'sprung from the earth'. In the present article, 'autochthony' is preferable to 'indigenusness' for two reasons. Firstly, several of the studies on which this article is based were carried out in French-speaking countries where the term *indigène* has a pejorative connotation owing to its use by colonial rulers to designate less advanced native peoples. Secondly, we do not consider indigenous peoples or autochthons in marginal terms, but rather as groups of people who are recognised as having primacy of settlement in a given territory and the right to regulate access to natural resources.

The notion of autochthony as it is used here is a dynamic social construction that often tends to exclude categories of people previously accepted as locals. This is illustrated by clashes between various groups of populations since the 1990s in West Africa, with the beginning of the democratisation process that gave more power to people who had previously been less involved in decision-making processes. The autochthony discourse was then used as a tool to repair ethnic disparities in access to natural resources in areas such as the Lake Chad floodplains (Socpa 2003). In Côte d'Ivoire, local people found an opportunity to exclude communities who had recently settled in their homeland due to difficulties in access to scarce natural resources (Richards and Chauveau 2007). However, strong opposition between groups is rooted in colonial times and motivated by the need for locals to safeguard ancestral land or their resources in general (Bayart et al 2001). Exclusion discourses always express 'natural' emotions and desires, such as protection of ancestral heritage, the fear of being 'contaminated' by foreign influences (Geschiere 2005), or the need for security in regulating access to scarce resources.

Religious dimensions are often important in understanding how political identity affects the build-up to and the continuation of a conflict. From his study in Côte d'Ivoire and neighbouring Ghana, which has the same socio-religious and geographical characteristics, Nordas (2007) concludes that although the conflict does not show many of the characteristics of a religious war, religion has become an important label that increases identity polarisation. However, based on the example of Ghana, this author recognised that the existence of religious fault lines does not predetermine bloodshed. Many authors in Côte d'Ivoire have developed arguments about the main cause of the war, following the same lines and making 'identity' the central issue at stake (Dembélé 2002; Akindès 2004). However, Marshall-Fratani (2006) showed in her study of Côte d'Ivoire that mobilisation of the categories of 'autochthony' and 'territorial belonging' among different actors involves redefinition of the notion of citizenship and the conditions of sovereignty.

During colonial times and after independence, cocoa production in West African coastal countries was a magnet for immigrants from the north who first came as labourers, but soon managed to establish their own farms (Ceuppens and Geschiere 2005). This trend was favoured by local authorities that deliberately encouraged immigrants to push the 'frontier' of cocoa production ever further south (Dozon 2000). However, during the 1980s, when economic crisis was followed by structural adjustment programmes, cash crop prices col-

lapsed and forests quickly diminished. This resulted in a drastic change in the affective relationships between indigenous and immigrants.

One major change occurred in the 1990s with multiparty systems and democratisation processes. Ceuppens and Geschiere (2005) argue that during the 1990s, the question of autochthony became a burning issue in many parts of Africa, inspiring violent efforts to exclude 'strangers' who suddenly turned into political rivals of the local elite (see Socpa 2003). This movement was closely linked to the trend of democratisation, which has often relied upon ethnicity. Thus, in a context of democratisation, autochthons take it for granted that they should rule in their own area, but some groups of people, due to their primacy of settlement, see themselves as more 'autochthonous' than others and try to exclude the latter from natural resources and political power (Socpa 2003; Fokou 2008).

This analysis indicates that in West Africa, the influence of both internal and external factors helps to shape the dichotomy between 'local' and 'non-local' autochthons and strangers. Conflicts often emerge on the grounds of deep disparities between ethnic groups over access to natural resources (land, pastures and water), commercial exchanges, and access to political power (Socpa 2003). This was demonstrated by case studies carried out in West Africa (Schelling 2002; Landolt 2003; Fokou et al 2004; Fokou and Landolt 2005; Fokou 2008; Chenal 2009). These studies have helped to demonstrate that notions of institutions, public space and conflicts are interrelated and affect access to resources by groups of actors. This is best illustrated by analysis of institutions for pastoral resource management in semi-arid areas.

#### **4.3.2 Shifting boundaries in access and natural resource management**

In West Africa today, natural resource users such as mobile pastoralists in the Sahel are having increasing difficulty earning a livelihood. Very often, they have to move far beyond national boundaries. Voluntary or forced, mobility has affected notions of autochthony and belonging, causing changes in institutions concerned with resource management. Boundaries here are not only political, geographical and national – types of boundaries that are very fluid in the West African context – but ecological, socio-economic and professional as well. This is illustrated by: 1) the dynamics of the production system (livelihood diversification); 2) re-creation of new borders in West Africa through treaties<sup>8</sup> aimed at removing obstacles to the free movement

of goods, capital and people in the sub-region; 3) ecological changes and increased competition over land; 4) rural migration: rural people are increasingly migrating to towns while absentee owners, mostly city dwellers, are gaining more bargaining power in the development of rural areas.

As demonstrated by a case study in Togo (Tezike and Dewa-Kassa 2008), West African countries are rapidly moving towards political and economic regional integration marked by free movement of people and goods across borders. Therefore, pastoralists from the Sahel (Mali, Burkina Faso and Niger) are increasingly moving to coastal countries (Togo, Ghana, Côte d'Ivoire) for better living conditions. If mobility is vital for pastoralists from the Sahel, the arrival of foreign herders in coastal countries poses problems of regulation of access to pasture, as well as social problems (conflicts over resources) and animal sanitation problems (bovine tuberculosis, foot-and-mouth disease, uncontrolled breeding). These issues help to reinforce the animosity of sedentary populations (Tezike and Dewa-Kassa 2008). Thus, access to natural resources becomes more complex and helps to bring about change in institutions, and also reshapes notions of autochthony and belonging. This change in physical, financial, socio-professional and legal borders has affected interactions between groups of users and institutions concerned with natural resource management.

Studies in the Lake Chad area (Landolt 2003; Fokou and Landolt 2005; Fokou 2008) have shown that natural resource management is made more difficult in a context where legal pluralism prevails. Across Africa, the management of natural resources is often based on several types of legal systems: statutory and customary systems and combinations of both coexist in the same territory, resulting in overlapping rights, contradictory rules and competing authorities (Cotula 2005). In this process, external factors such as new political structures, infrastructure and technologies have reduced access costs for external users who, due to difficult economic conditions, see key resources (game, fish and cattle) as valuable sources of income, just as locals do. But while local rules have been dismantled, the new bureaucratic institutions which have replaced them failed to put in place mechanisms of management, monitoring and penalties, thus confirming the lack of a clear authority. Fokou (2008) demonstrated that in the Lake Chad floodplains most resources are increasingly under open access or have been privatised. In open access constellations, politically stronger individuals and outsiders obtain the biggest share, ignoring rules governing access and use of natural resources. In the Sahel or around Lake Chad, for instance, institutional

cross-border modalities exist but do little to give transhumant pastoralists better access to natural resources or basic social services such as health facilities for human and animals, drinking water, and markets (Schelling 2002; Fokou 2008). In this open access situation, several trends concerning the use of resources were observed: firstly, boundaries are no longer clearly defined, as foreigners easily cross borders to use pockets of resources; secondly, local populations often claim their exclusive rights over resources by means of violence; thirdly, less powerful actors lose out and are forced to use natural resources even more intensively. Finally, this leads to depletion of pockets of natural resources and to outbreaks of conflict.

#### **4.3.3 Presence-absence of the state, mismanagement of natural resources, and outbreaks of conflict**

Throughout the African Sahel, scarce pockets of resources are increasingly under pressure as a result of the intensification of agricultural activities, pastoral settlement, and privatisation of land (Niamir-Fuller 1998, p 253). Natural resources have been put under different management regimes in order to promote sustainable use. This trend is visible in discourses used by diverse groups of actors to justify their access to resources. In a context of migration, newly arrived 'strangers' have developed a new rhetoric to challenge the management regimes of the autochthons considered as 'sons of the soil'. Very often, they argue that with democracy, the majority determines how resources should be used. Democracy is then reinterpreted as the freedom to access and use resources as one pleases (Fokou and Landolt 2005). This attitude is reinforced by the high social status acquired by some of the newcomers, who are 'rich' pastoralists. In the new institutional context where poorly paid members of the local bureaucracy initiate various strategies to generate personal profit, livestock owners often use their wealth to attain a better socio-economic position (e.g. by paying for exclusive rights to rangelands or bribing authorities during conflict settlement). As a result, management of resources is 'autochthonised', and the so-called outsiders, due to their late arrival, are increasingly excluded. The recent emergence of patriotic movements (e.g. Côte d'Ivoire) and rebellions (e.g. Tuareg of northern Mali) illustrates the new discourse of autochthons based on the willingness of socio-political actors to impose sovereignty on a territory or a nation-state. However, it could also be interpreted as the expression of social frustration among groups of people confronted with difficulties in achieving their livelihood goals. The emergence of conflicts in arid areas such as northern Mali, where there are no other ethnic groups with competing land claims, recalls



the debate about autochthony and land rights. With a feeling of being threatened over their own land and excluded from resources by powerful ‘outsiders’, local people tend to develop animosity toward other social groups, even when they consist of citizens of the same country (Landolt 2003; Fokou and Landolt 2005; Haller and Helbling 2005; Fokou 2008). In a context of diminishing natural resources and insecure access, the ideological opposition between ‘locals’ and ‘strangers’ or ‘real autochthons’ and ‘fake autochthons’ is growing and resulting in outbreaks of conflict.

#### **4.4 Autochthony and integration: the inevitable collaboration for sustainable development in West Africa**

##### **4.4.1 A malleable notion of citizenship in West Africa**

The notion of citizenship, which can be considered as a regime of rights and duties that links an individual to a state, centres on the status of the citizen acting in accordance with the law, their position as a political agent actively participating in a society’s political institutions, and their membership in a political community that furnishes a distinct source of identity (Bayart et al 2001). In the African context, these characteristics change constantly. In Côte d’Ivoire, for instance, the notion of autochthony has taken a new trajectory. It was first directed against people from outside the country: mostly against the Burkinabe, who, since the 1950s, have migrated in great numbers to the south in order to participate in the booming plantation economy of Côte d’Ivoire (Tokpa 2006). As long as the autochthony discourse was directed against immigrants from beyond Côte d’Ivoire, the fear of ‘outsiders’ rather strengthened the idea of Ivorian national citizenship. However, developments in the last few years have shown how quickly the term can be re-interpreted and re-directed against fellow Ivoirians (Geschier 2005). The question is: what does citizenship mean today? Is a citizen the local leader who considers that “the goat grazes wherever it is tied” to justify corrupt practices? Is it a migrant who actively contributes to the booming national economy but is nevertheless considered a foreigner? Can it be the nomadic pastoralist who keeps changing nationality according to the countries visited during transhumance in order to pursue pastoral activities peacefully?

The answer lies somewhere in between. This elasticity in the notion of citizenship could be seen as a need to recreate rules to provide various groups

of people with 'institutional incentives' for natural resource management, social dialogue and peaceful consolidation. This could be made possible by clearly defining the role of the state in satisfying the basic needs of citizens. In many cases, frustration among groups of resource users is caused by the feeling they have of bearing the costs of national development but not clearly benefiting from profits generated by their activities or from the resources in their region. Rural populations are often confronted with many difficulties: exclusion from their land due to public activities such as the establishment of protected areas, damage to their assets (animals and crops), levying of taxes by the state, and overuse of resources such as forests, fishing or mining reserves by multi-national companies without any social investment (Geschiere 2005; Fokou and Haller 2008). Transhumant pastoralists, for instance, feel that they are regarded as citizens only when they contribute to state income (Fokou 2008). Most of the time taxes collected by the state are not converted into basic social infrastructure and services (wells, delimited transhumance corridors, public health, veterinary facilities, etc.). As expressed by local populations in the Lake Chad area, their losses are far greater than their gains (Fokou and Haller 2008).

The situation could be reversed through more scientific research to help bridge the gap between policies and groups of actors. In this process, many studies have been initiated to analyse how the state interacts with different actors such as traditional authorities, local or regional governments, civil society, and domestic and global actors.

#### **4.4.2      Negotiating statehood and sustainable development**

In West Africa today, the paradoxical situation emerging from the opposition between the strong appeal for regional integration and the exclusionary behaviour of some local people poses the question of negotiating statehood for sustainable development. One should not trivialise the collective action of local groups to exclude other users from land and resources. However, the important aspect is the 'presence-absence' of the state, which benefits some local powerful actors trying to keep, revitalise or transform certain traditional institutions because the rules give them power and access to common-pool resources (CPRs) for commercial reasons. The analytical setting for the relationship between statehood and livelihood can be found in public space. As defined by Habermas (1993), public space is a platform to explain conflicts but also a place to analyse the spatial distribution of conflicts. If public space reveals the strategies of private actors to gain ownership of

land, form social groups and exclude other users, it remains for many people a place of contest (in its spatial and political dimensions) and protest; a place where poor and voiceless people have an occasion to express themselves. It is above all a shared and disputed space (Chenal 2009).

Analysis of public space shows that nowadays interactions between constituted social groups are taking a particular trajectory, with the emergence of youth movements trying to show their patriotic ideologies through clear political positions.<sup>9</sup> Youth, women, natural resource users, politicians and other social categories use public space to express their frustrations and malaise. These dynamics of the means and spaces of protest and affirmation of one's identity sound like an appeal to revisit the political, economic, social and cultural criteria on which citizenship has been based and how this notion has changed through time. The central question in this diachronic perspective is to examine the way the encounter between 'locals' and 'foreigners' has helped to shape national citizenship.<sup>10</sup> This process passes through tensions and conflicts which should be situated in a context of political economy or access to livelihoods. Thus relationships between power, violence and wealth accumulation appear to be central to analysis of the interaction between social groups. In Côte d'Ivoire these relationships, which are part of an iterative process, help to understand and explain the new status of the cocoa sector.<sup>11</sup> Here the cocoa sector is understood as a site of conflicting social relations in which different actors deploy different strategies in order to benefit from the surplus of capital.

## **4.5 Conclusion**

This analytical process has demonstrated how, in a context of natural resource scarcity, the concept of autochthony is instrumentalised by actors to serve their interests. The notion of autochthony is above all socially constructed and the result of power struggles. The main agenda of the new autochthony movements is the exclusion of supposed 'strangers' and the unmasking of 'fake' autochthons, who are often citizens of the same nation-state. It is understood that resources are becoming scarcer and, in response, groups of users adopt various strategies to guarantee their livelihoods. To achieve this, they build their discourses and strategies on shifting views of nationhood or identity so as to be able to exclude other users.

Today, discourse on autochthony is easily adapted to the ongoing redrawing of borders and public spaces that seems to be inherent to processes of decentralisation and globalisation. The emphasis in development policies on by-passing the state, decentralisation and support for NGOs seems to have worrying consequences on the ground (Geschiere 2005). Many blueprint development solutions appear to contribute to conflict exacerbation and to redirecting the notion of autochthony in a dangerous direction. Inversely, the notion of autochthony can contribute to national development when various segments of populations are given real incentives for sustainable management of resources. But this is still a big challenge for African nation-states. For many resource users in West Africa, “frontiers do not matter”, they move across countries in search of better living conditions. To control this flux and avoid conflict, there is a need to implement multi-level institutional frameworks such as updated pastoral codes and norms for natural resource management that could directly improve the livelihoods of people, indirectly improve their access to basic social services, and enhance social dialogue.

## Endnotes

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<sup>6</sup> Examples of such cross-border social groups include the Tuareg in Niger and Mali, the Arab Choa in Nigeria, Chad and Cameroon, the Fulani in the whole of West Africa, and others.

<sup>7</sup> Three PhD studies on the historiography of citizenship, the political economy of cocoa, and the emergence of youth patriotic movements are currently in progress in Côte d’Ivoire.

<sup>8</sup> Treaties of the Economic Community of West African States (ECOWAS), signed by 15 countries in Lagos, Nigeria, on 28 May 1975.

<sup>9</sup> Cf. PhD research by Gnangadjomon Koné on “Emergence of the patriotic youth movement in Côte d’Ivoire” currently in progress.

<sup>10</sup> Cf. PhD research by Henri-Michel Yéré on “Negotiating citizenship in 20<sup>th</sup>-century Côte d’Ivoire” currently in progress.

<sup>11</sup> Cf. PhD research by Mathieu Gasparini on “Power, violence and accumulation in Côte d’Ivoire: The cocoa sector in transition” currently in progress.

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