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Environmental Peacebuilding: Managing Natural Resource Conflicts in a Changing World

swisspeace Annual Conference 2007

Didier Péclard, Editor

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With contributions by:
Christine Bichsel
Simon Dalby
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Tobias Hagmann
Peter Maurer
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Table of Contents

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Abstract/Zusammenfassung/Résumé

With the current attention given to climate change and global warming, the issue of "environmental security" is back high on the agenda of the international community. Environmental degradation is increasingly considered as a potential cause for the (re-)emergence of violent conflicts due to shrinking natural resources such as drinkable water and land. However, research on the issue has shown that there is very little empirical evidence of a direct causal link between environmental degradation and violent conflict. In order to set effective priorities for environmental peacebuilding, it is important to understand - particularly in situations of environmental stress - how natural resource conflicts are embedded in social and political dynamics, how they are managed by local institutions, and how these institutional arrangements can be supported through outside intervention. Based on a research project conducted by swisspeace within the framework of the NCCR North-South, the swisspeace annual conference 2007 explored those complex linkages and formulated entry points for improving intervention strategies by external actors.

Dank der wachsenden Aufmerksamkeit gegenüber Klimawandel und -erwärmung ist das Thema „Umweltsicherheit" hoch auf der Agenda der internationalen Gemeinschaft anzutreffen. Umweltzerstörung und die dadurch knapp gewordenen natürlichen Ressourcen werden zunehmend als mögliche Ursache für das (Wieder)aufflammen von Konflikten betrachtet. Forschungen haben jedoch ergeben, dass es noch wenig empirische Beweise für einen direkten kausalen Zusammenhang zwischen Umweltzerstörung und Gewaltkonflikten gibt. Um Prioritäten in der Friedensförderung im Bereich Umwelt zu setzen, ist es wichtig zu verstehen, wie Konflikte um natürliche Ressourcen im sozialen und politischen Kontext eingebettet sind, wie lokale Institutionen diese Konflikte bewältigen und wie sie dabei von aussen unterstützt werden können. Aufgrund eines Forschungsprojektes von swisspeace im Rahmen des NCCR North-South hat sich die swisspeace Jahreskonferenz 2007 mit diesen komplexen Zusammenhängen auseinandergesetzt und mögliche Interventionsstrategien für aussenstehende Akteure formuliert.

Dans la foulée des débats actuels sur le changement climatique, le concept de "sécurité environnementale" a fait son retour sur le devant de la scène internationale. La dégradation de l'environnement est en effet de plus en plus considérée comme une cause potentielle de conflits violents autour de l'accès à des ressources en diminution telles que l'eau potable et la terre. Pourtant, la recherche sur ces questions a montré que les preuves empiriques d'un lien direct entre la dégradation de l'environnement et le déclenchement de conflits sont inexistantes. Si l'on veut faire les bons choix en matière de promotion de la paix dans le domaine de l'environnement, il est impératif de comprendre comment, en particulier là où l'environnement représente un facteur éventuel de tension, les conflits autour des ressources naturelles s'inscrivent dans des dynamiques sociales et politiques, de voir quelles sont les institutions qui tentent de gérer ces conflits au niveau local, et d'analyser la façon dont ces institutions peuvent être soutenues de l'extérieur. Sur la base des résultats d'un projet de recherche mené à swisspeace dans le cadre du NCCR North-South, c'est sur l'analyse de ces liens complexes et sur la façon dont les stratégies d'intervention de l'extérieur pourraient être améliorées que s'est penchée la conférence annuelle 2007 de swisspeace.

Introduction

Didier Péclard[1]

With the current attention given to climate change and global warming, the issue of "environmental security" is back high on the agenda of the international community. Indeed, environmental degradation is usually considered, in the climate change scenarios, as a potential cause for the (re-)emergence of violent conflicts due to shrinking natural resources such as drinkable water and land. As a recent report of the German Advisory Council on Global Change recently put it, "climate change will overstretch many societies' adaptive capacities within the coming decades", and this "could result in destabilization and violence, jeopardizing national and international security to a new degree" (WBGU 2008: 1).

If it has gained renewed salience, the issue is not new. It is towards the end of the Cold War that the environment started to be considered as a potential threat to international security in the wake of ecological disasters such as the Tchernobyl 1986 nuclear accident, drought and desertification in the Sahel belt or debates in Western Europe about the possible death of forests. Reflection and research on how to ensure the security of states moved from an exclusive concern with protection against nuclear weapons to the protection of the environment itself.

Since then, a number of research programmes have been launched in order to study and, if possible, "measure" the links between environmental degradation and the occurrence of violent conflicts worldwide. This was the case, for instance, of Thomas Homer-Dixon with his Canada-based team (Homer Dixon 1994; 1999) and the Environment and Conflict Project (ENCOP) led by Günther Baechler and Kurt Spillmann (Baechler 1994; 1998). The two teams differed in their theoretical backgrounds and terminology. However, they both tried, on the basis of aggregated empirical evidence from a number of case studies, to establish causal links between environmental degradation, increased scarcity in renewable natural resources and the occurrence of violent conflicts, with particular focus on developing and transition countries.

Both groups came to comparable conclusions, showing that scarcity and environmental degradation alone were rarely a direct cause of violent conflicts. But both also added that environmental degradation combined with other triggering factors such as socio-economic, ethnic or social inequalities could, and in many cases did, contribute to such conflicts.[2] In other words, a consensus was gradually reached around the idea that conflicts linked to renewable natural resources such as land and water could not be traced back to a single explanatory factor such as environmental degradation, and that they depended on a plurality of social, political, economic and environmental factors. Over a decade after most of these early studies were published, the link between environmental degradation and conflict remains as elusive and difficult to ascertain on the basis of empirical evidence despite widespread claims to the contrary present in popular discourse, in the media as well as in scientifically based publications such as the latest report of the International Panel on Climate Change (Gleditsch & Nordås 2009; Breitmeier 2009).

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[2]   See Hagmann 2005 and Breitmeier 2009 for critical reflections on the two research programmes.

It is on this historiographical basis that a research project on environmental conflict was elaborated as of 2001 at swisspeace within the framework of the National Centre of Competence in Research (NCCR North-South).[3] Rather than re-opening the debate about the causality between natural resources and conflict, the programme set out to understand and analyse how, in situations of environmental stress, potential conflicts around natural resources were managed by local and international actors (Goetschel and Péclard 2006). To do so a shift in perspective "from environmentally induced conflicts to natural resource-*use* conflicts" was suggested (Hagmann 2005: 21). This implied that issues such as scarcity and environmental degradation had to be analysed (1) in the context of social and political relations between the concerned user groups, (2) in relation to the role of institutions set up to manage resource use patterns and (3) by taking into account the social and cultural rationale of groups involved in natural resource management and/or conflicts (ibid: 21-22).

The aim of the 2007 swisspeace annual conference upon which this publication is based was to share some of the main results of the NCCR North-South research programme on environmental conflicts with other scholars and with practitioners in order to:

- *explore* the linkages between (renewable) natural resource and conflict management in developing countries by reference to global environmental change as well as current resource and environmental management practices both within and outside of development cooperation;
- *provide* insights into the challenges and best practices of the peaceful management of key renewable natural resources in different parts of the world;
- *foster* exchange between researchers and practitioners in achieving a more holistic understanding of the complexities of 'environmental peacebuilding' by different sets of actors;
- *formulate* entry points for improving current intervention strategies by external actors as well as entry points for innovative future research in the realm of environmental conflict and resource management.

The present swisspeace conference paper takes up some of these points from both a research and a practice-oriented perspective.

In his opening contribution, Simon Dalby proposes a critical overview of twenty years of debate on "peacebuilding and environmental security" since the Report of the Brundtland Commission on "Our Common Future" was released in 1987. Arguing that we now live in a new ecological era, the Anthropocene, "where we are actively remaking an environment that can no longer be considered separate from human actions" he warns that the discussion on environment causing conflict has "come full circle" back to where it started, and that therefore "we have to think very carefully about the appropriate contexts in which we should consider environment and conflict in order to get priorities for peacebuilding right". He draws four main lessons from earlier debates and argues that there is a need to (1) think and work in an interdisciplinary manner; (2) take account of the crucial role played by the local contexts in which insecurity and violent conflicts play out; (3) give due attention to the institutional set up within which policy responses are conceived; and (4) link up conflicts at the local level with global discussions on environmental change.

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[3] See www.north-south.unibe.ch.

The relationships between local conflict settings and global debates, as well as the key role of institutions are also central to the research results presented here by three former PhD students within the "environmental conflict" programme of the NCCR North-South.[4] Drawing from his research on conflict management dynamics in pastoral societies of East African lowlands, Tobias Hagmann makes a strong case against reductionist analyses of and intervention in violent conflicts in contexts of competition over natural resources. "Herders", he argues, "do not simply fight over the desert because they are animated by subsistence need, but because they pursue politically, culturally and economically rational agendas" that have as much to do with access to land and water as to "competition over urban real estate, multi-party elections and state budget."

In her article on disputes over water in the Ferghana Valley, a region considered by many as a "flashpoint of conflicts" in Central Asia, Christine Bichsel looks at the conflict transformation programmes of three international aid agencies (SDC, Mercy Corps and UNDP). Focusing on the social, cultural and political dimensions of these conflicts, she argues that the agencies "do not pay enough attention to the issue of power in natural resource conflict management". It is the very understanding of the root causes of conflict that is at stake here. Because these agencies see conflict as "endemic to the local context" and as the result of competition over scarce resources between ethnically homogeneous communities, they develop inappropriate conflict transformation strategies. Indeed, scarcity is not just an observable reality; it is also a social and cultural construct, based on the historical dynamics of power relations between groups and communities, and this dimension needs to be taken into account in mitigation strategies rather than imposing normative views on social change and harmony.

From an econometric perspective, Moges Shiferaw also strongly argues in favour of an approach that takes social relations into account. In his analysis of property rights reform in the water sector in Ethiopia, he indeed shows that the key to solving dispute over water property rights is "to get the relationship among water sharing parties right" rather than simply focusing on property rights themselves. Equity should be taken into account, not only efficiency.

With the last two contributions, the focus shifts from academic research to experiences from practitioners, firstly at the very local level, and then from a global vantage point. In his paper, Aly Dama from the Swiss NGO Helvetas Mali, presents results and lessons learnt from a programme for the prevention and management of natural resources conflicts in the Malian Sahel. Based on two concrete example, the paper shows that, if conflicts between groups relying on different production systems for their livelihoods (e.g. herders vs. farmers) as well as intra-groups conflicts tend to increase and escalate after periods of severe drought, climatic conditions are by far not the only factor contributing to violent actions. More importantly maybe, the example of Mali shows how conflict prevention and transformation mechanisms at the local level can be a very efficient tool provided local communities and their leaders are given "the competences to negotiate agreements with other groups and with the government", and provided "the negotiated solutions are confirmed on a legal level". In such a context, the role of the state would lie in "the definition of a general framework, leaving the concrete implementation to local authorities in charge of regulation and social stability."

As Simon Dalby argues in his contribution, it is crucial for environmental peacebuilding strategies to link local conflicts with global dynamics of climate change. This is why this volume ends on a contribution by Peter Maurer, Swiss Ambassador to the United Nations, on Switzerland, the UN and environmental peacebuilding. He notes that, while environment and security issues have both had positive developments within the UN system, "the focus on linkages between them is far less

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[4]   For a full list of the PhD theses written as part of the programme see Annex 1.

pronounced than the nexus between environment and development." In order to bridge this gap, he argues, the question needs to be addressed at the conceptual, operational and governance levels, while information sharing on environment and conflict must be improved and new peacebuilding instruments developed based on renewed global partnerships. The UN is well suited to take up these issues, but for this to happen the environmental pillar within it will have to be strengthened, and the doubts of a number of UN members regarding this overcome. This is a task that Switzerland has taken up at the political and operational levels, even though the prospects for success look dire.

There is little doubt, unfortunately, that the severe consequences of climate change foreseen by experts of the IPCC and other research bodies - such as shrinking drinkable water resources, rising sea level and protracted drought periods - will put severe stress on many societies, especially in the 'Global South'. But, as the research results presented in this volume clearly show, the challenge for environmental peacebuilding is to avoid drawing strategies based on a reductionist understanding of what we defined here as natural resources *use* conflicts. This means essentially three things: (1) take full account of the inherently *political* nature of violent conflict; (2) pay due attention to the *institutional mechanisms* of conflict prevention in the concerned societies and devise strategies in order to reinforce them; (3) see these conflicts as *part of wider processes of social and political change* both at the local and global levels.

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1 Peacebuilding and Environmental Security in the Anthropocene

Simon Dalby[5]

1.1 Twenty Years of Environmental Security

On the twentieth anniversary of the publication of the Brundtland Commission's report on "Our Common Future" in 1987 it is worth reflecting back on the intellectual trajectory of the debate about environmental security to see how the discussion has changed and why. While the geopolitical circumstances have changed substantially, geopolitical considerations do continue to shape both the academic and the policy debate on sustainable development and its relation to conflict and peace. Over the last two decades discussions of security and the emergence of both critical scholarship which challenges the taken for granted assumptions in security thinking, and the parallel policy discussions of human security have likewise shifted how these issues are understood and how peacebuilding might now be considered.

More recently climate change and earth system science have begun to change commonly held assumptions about environment. The sheer scale of human activities now means that we are living in a new geological era, the Anthropocene, where we are actively remaking an environment that can no longer be considered separate from human actions (Flannery 2006). Hence rethinking both security and environment are necessary in addition to connecting these themes with renewed concerns about resource wars. All of which suggests both how we ask questions about peace, nature, conflict, and how we make policies to deal with dangers and build peace, need to be updated and adapted to be appropriate in the new circumstances.

The initial formulations of sustainable development in the 1980s were codified by the World Commission on Environment and Development (1987), but nearly taken for granted in the document is the assumption that violence is likely in imminent struggles for access to scarce resources. And at least implicit in much of the discussion is the argument that renewable resources are a key part of this problem, and that such shortages will likely be aggravated by environmental degradation of various sorts. This line of argument fed the initial formulations of what became the discourse of environmental security, and has continued to shape many of the discussions since.

The second stream of thinking that fed into the discussion was the "rethinking security" debate at the end of the cold war; if the Soviet Union was no longer a threat to the West then what else might be? Among the many contenders were ethnic nationalism, migration, drugs, loose nukes, diseases, and the global environment (Klare and Chandrani 1998). Concerns about ozone holes and climate change raised questions of global warfare over such issues in the future. These two key questions, first the empirical one concerning if and when environmental changes might cause conflicts where and how, and the second one concerning the appropriate policy responses to these conflicts which are understood to have security implications in many disparate ways, structured the debate through much of the 1990s.

In early years of the current decade this whole discussion got effectively turned upside down when the "greed not grievance" arguments suggested that abundance rather than scarcity was related to violence in the "new wars" of the 1990s (de Soysa 2002). Here the suggestion is that resources that are worth fighting for when few other economic options are available are the source of organized violence. One fights to control revenue from natural resources if one has few other options. Thus the discussion of conflict diamonds, the violence surrounding oil resources in many places and the destruction of tropical forests to support insurgencies, suggested a very different set of circumstan-

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[5]   Professor, Department of Geography and Environmental Studies, Carleton University, Ottawa.

ces relating to conflict, and more directly tied concerns with violence in the peripheries into discussions of consumption in the metropoles of the global economy (Le Billon 2005).

The environmental security and resource wars discussion has also been partly eclipsed by the discussion of global resource issues, and petroleum geopolitics in particular in the aftermath of the American invasion of Iraq in 2003 (Klare 2004). This in turn has fed into a renewed concern with popular discussions of "peak oil" and the relationship between American imperial actions in South West Asia connect to discussions of the implications of consumption and security of supply for the American polity in particular, and the global economy more generally (Kuntsler 2006). It would appear that the resource war arguments are playing out at a much larger scale in the case of petroleum and American global security policy (Bacevich 2005).

But in 2007 once again the environment re-entered the discussion at the largest of scales. It is now indisputable that the by product of this "carboniferous capitalism" is literally changing the planet's air and inducing climate changes that will in turn render many people, in particular the poor in the global South, vulnerable to environmental disruptions (Flannery 2006). Thus over the last two decades as the growing recognition of the scale of human activities has lead to the recognition that we are effectively living in "the Anthropocene", the discussion has come full circle, back to where the argument of environment causing conflict started. But it adds an important additional point; we have to think very carefully about the appropriate contexts in which we should consider environment and conflict in order to get priorities for peacebuilding right. Thinking through this history of environmental security raises the simple but important matter of what lessons can be drawn from the larger theoretical reflections.

At least four crucial lessons seem to need emphasis although all four are very difficult to encapsulate concisely.

One crucial lesson is disciplinary; lessons that are drawn tend to follow from what questions are asked, and these in turn are premised on the disciplinary training of those asking the questions. Economists concerned with global comparisons and national development statistics don't pose similar questions to political scientists interested in war causation. Neither discipline is much concerned with detailed fieldwork in conflict zones.

The second lesson concerns questions of how the social, economic and physical locales in which insecurities happen shape both the patterns of violence and the opportunities for peacebuilding. The critical literature in security studies is especially relevant here because it focuses attention on who specifies threats, and how identities are mobilized in a crisis in ways that are then "securitized" (Fierke 2007).

This is related to a third lesson, or more precisely the institutional context within which policy questions are formulated. Quite how the problems of environment and conflict are posed is related to the policy prescriptions and the institutions empowered and funded to act. Whether environmental difficulties are understood as matters of development, conflict, human security or part of the war on terror matters in terms of likely policy responses.

But these discussions too are overshadowed now by the fourth lesson concerning the need to feed all the smaller scale conflict discussions, and the debate about resources, scarcity, development and peacemaking back into the larger concerns with global environmental change.

1.2 Disciplines and Discourse

The discussions over the last couple of decades about conflict and environment have at times been rancorous, sometimes humourous, but have rarely come to widely agreed consensus on core themes. This is not the place to rehearse once again the history of all this (see Dalby 2007a), but some brief

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comments are necessary. The initial premise of the WCED (1987) that environmental degradation would cause conflict was widely accepted among the commentators at the time. What is notable about Thomas Homer-Dixon's (1991) intervention in the early 1990s is that he for one did not accept the basic premise and turned from a wide ranging policy discussion to try some detailed empirical work that would establish the parameters of how environmental change might be a problem, and specifically how it might lead to what he called acute conflict. Simultaneously Daniel Deudney (1990) was making the case that linking environment to the then conventional understandings of security was likewise not necessarily a good idea given that the military in particular was not an appropriate institution to do environmental projects. Much of the subsequent discussion has followed from these initial points.

The initial complaints by Nils Petter Gleditsch (1998) in particular about the discussion of environment and conflict focused on war, something that Homer-Dixon (1994) had suggested was unlikely to be caused by environmental change, but was still in the larger discussions as a matter of concern. Geographers who work in the field of what has become known as political ecology were annoyed that Homer-Dixon's analysis apparently ignored their contribution and the sheer complexity of the relationships between environment and violence in many places (Peluso and Watts 2001). But the failure to speak across disciplines has not gone away in the intervening years. A recent case in point is the appearance of a comprehensive paper in the prestigious *Annals of the Association of American Geographers* on land wars and Brazil which doesn't cite the peace research literature on resource wars, much of which at least appears to be relevant to the conflict in the south of Para (Simmons et al. 2007). These difficulties or these failures of cross disciplinary dialogue remain; they don't help in generating appropriate peacebuilding policy discussion. Hence scholarly research simply doesn't generate an obvious policy agenda.

Economists and political scientists concerned with national data sets as the empirical source for discussions of war and conflict focused on resources and exports rather than environments and not surprisingly ended up suggesting the importance of these factors in causing conflict. All these debates continue to this day suggesting both the complexity of matters under investigation, and clearly that different disciplines explain things in different ways which may not be compatible (Korf 2006). What is not clear is why any particular discipline might be understood to have a monopoly of wisdom on any of these matters. Hence key questions are still very open to disciplinary interpretations which are likely to come to divergent conclusions, not least because their initial assumptions are so different.

The matter is not solved by the addition of multiple disciplines because both what is deemed an appropriate method is not clear, neither is there agreement on what counts for evidence given different notions of both conflict and environment, not to mention resources and scarcity. The timing of the initiation of violent conflicts is also key, and the duration once they start too (Korf 2005). Where migration of animals is involved, as it is in places in Africa in particular conflict between herders and pastoralists may be a seasonal matter as different modes of extracting a living collide at particular times (Baechler 1999). These matters are not likely to be caught in national scale economic statistics that are grist for the economist's mill. But in turn the micro level analysis of rural sociology and geography may not integrate the local well with larger global economic changes that determine matters of price and market access for local production (de Soysa 2002).

It was precisely such complexities that led scholars involved in the NATO investigations of these matters in the late 1990s to pose a whole series of syndromes of change to try to encapsulate the multiple variations of environmental change that might cause conflict (Lietzmann and Vest, 1999). It is likewise crucial to recognize that different circumstances produce different modes of conflict, and the social organizations and cultural logics of particular peoples are key to understanding where conflict might arise, the circumstances in which it persists and the possibilities for conflict resolution (Suliman 1999). It also suggests very clearly that whether conflict turns violent or not is a matter related to institutions and the possibility of adaptation, negotiation and mitigation in a crisis.

Lessons from one case may be transferable but the specific contexts may preclude this; empirical investigation of particular cases is needed.

In parallel with all this discussion of security in the 1990s the literature on environment too had challenged the assumptions of environmental degradation as the starting point for discussion. The burgeoning field of political ecology in particular made it clear that blaming rural ignorance and bad management practices for environmental problems was at least misleading in most cases (Peluso and Watts 2001). The case of the failure of either the Chinese or Indian states to incorporate new approaches into thinking about the Himalayan region in the aftermath of the realization that earlier arguments about the causes of erosion in the mountains were seriously misleading, illustrates that scholarly research is not enough to get policy agendas to change (Blaikie and Muldavin 2004). Political discourses drive policy, in these cases much more so than the academic research that disputes the assumptions in the policy formulation.

Overarching this is the question of political power, and the ability of elites to use it to further their ends, not all of which are necessarily peaceful. Civil wars are often tied into the political economy of resource extraction (Ross 2004). At the heart of Thomas Homer-Dixon's (1999) analysis is an important point related to structural scarcity; in a crisis elites may often act to enhance their control over contested resources and are frequently willing to use violence to accomplish change. In short the whole Malthusian assumption of scarcity causing violence is not a tenable premise for serious scholarship, nor for much policy advice; the actions of state elites are frequently more important than rural shortages (Kahl 2006). This in and of itself might not seem to be a particularly helpful insight, but in fact, given the propensity for policy institutions to reinvent Malthusian arguments every few years, and portray the poor and dispossessed as a security threat to modernity, the point is actually of very considerable importance.

1.3 Contexts and Scale

At the largest scale this point is in some ways clearest. The global resource conflicts that are frequently invoked are mostly about oil these days, and seem likely to be about oil for the foreseeable future. They are obviously about the situation in the Persian Gulf, and in South West Asia in general. They are about old patterns of geopolitical rivalry, about the persistent attempt on the part of the American elites to use military force to control the trade in oil in the region (Klare, 2004, Bacevich 2005). The efforts to find new sources of oil, and the persistent rivalries over controlling supplies and the huge profits to be had from oil when the price is high, have focused attention once again on Africa as a source of raw materials for the global economy, and suggests one more "scramble for Africa" is currently underway (Carmody and Owusu 2007).

The Pentagon is once again rearranging the global commander's map of the world and is in the process of activating "AFRICOM"; Washington is paying attention. But none of that suggests that a global war for resources is being fought as such, at least not yet. Even if the American military launches the much anticipated air assault on Iran in the near future it may not amount to such a war. Although the ability to control the flow of petroleum to Asia is undoubtedly a key component in strategic thinking in Washington where China is understood to be an emerging geopolitical competitor. The ability to even realistically threaten to cut off fuel supplies in a crisis could give Washington a very important leverage in the future.

But oil isn't about scarcity at the margins; it isn't about violence caused by shortages but about control over an abundant resource that is the key to so much in the global economy. The global economy spreads such conflicts across national boundaries so impacts of consumption in one place are frequently displaced into other states and regions in a global economy of resource supplies (Simpson 2007). It may be about control over the global trade and about who controls access to the particular sources of supply, but this is not a resource that the marginalized peasantry of the third world are directly fighting over.

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On the smaller scale it is frequently the rural poor in many places that find themselves in the way when large energy projects are set in motion to fuel that global economy. In so far as they resist they too can be considered part of the relationship between environment and conflict but once again it is not about scarcity or environmental resources, rather it is about their being in the wrong place as far as development is concerned (Gedicks 2001). Where violence occurs in struggles over the impacts of "development projects" it is also worth noting that the conflicts in many cases may be about arguments over compensation for the disruptions of traditional livelihoods at least as much as direct opposition to the "development" (Walton and Barnett 2008), an important point that might be most useful for at least some peacebuilding policy initiatives.

This point might become especially important in the coming years if biofuels are promoted as the solution to both oil dependence and greenhouse gas emissions, and this in turn further accelerates the spread of large scale industrial agriculture that displaces subsistence farmers and small scale producers. But how such conflicts play out, and the crucial matter of how they might turn violent is usually context dependent, and related to the institutional structures that facilitate or prevent adaptation. This is a long standing matter of development though, a matter of rural change as commercial systems challenge and replace traditional modes of economy. Working out how this happens is a matter for anthropologists, geographers and other social scientists who are sensitive to context, field work and the small scale (Bohle 2007). But this does not provide for easy to generalize data of the sort that quantitative analyses by economists interested in cross national comparisons might consider appropriate scholarly method (Korf 2006). Neither does a focus on small scale field studies necessarily resolve matters; as some researchers have discovered, even small rural communities that might be reasonably be assumed to be largely dependent on local resources, are frequently more tied into the larger operation of the commercial economy than expected (Haag and Hajdu 2005).

Such a review of the literature suggests the sheer complexity of matters related to resources and the great difficulty scholars have in formulating appropriate notions of scale in all this (O'Lear and Diehl 2007; Dalby 2007a). How to contextualize is made especially difficult when it is clear that the global economy ties so many places together in commodity chains that span the globe. Fish caught in one ocean are landed in a port on the coast of another, frozen, shipped back across the seas to be processed into all manner of frozen products elsewhere. Likewise grain, and minerals and all manner of materials are on the move so that assumptions about local shortages and abundance are increasingly a matter of trade as much as they are a matter of proximate ecologies. Boycotts and "fair trade" certifications, policy instruments related to "blood" diamonds, and international campaigns on such matters as working conditions and child labour, make it clear that many resources that are in conflict in one way or another are in some senses unavoidably "global" (Le Billon 2007).

Borders and nation states also become difficult in the matter of carbon offsets and the attempts by many policy makers to "sink" carbon emissions from fossil fuel use in the global "North" by using forestry plantations in the "South". This might fairly directly link global consumption to very local conflict where land uses are disrupted and traditional ways relocated to make way for the plantations. This pattern of resource exploitation in the peripheries of the global economy is not a new trend either, even if it is now justified by various "green" rationalizations (Lohmann 2006). Once again the causes of such violence are about the expansion of the larger global political economy rather than obviously indigenous causes of conflict (Roberts and Parks 2007); getting the geographies of this clear is important if metropolitan policies are to be considered in terms of their likely peripheral impact.

Such reflections also make questions of international environmental action complicated. Nowhere more so than in Robyn Eckersley's (2007) ambitious attempt to extend the humanitarian intervention debate into matters of ecological defence and the right to intervention in the face of a major disaster or the extirpation of an important habitat or species. But quite why the international community

might intervene in a case such as the threatened eradication of the great apes in Rwanda, as she suggests, when it failed to intervene to save thousands of Rwandans in 1994 is not so clear. But taking the argument seriously suggests that many of those in the "South" whose lives and in the case of low lying island states, even the existence of their states, is in jeopardy as a result of climate change caused mostly by Northern consumption, have a much better justification for intervening in the North to stop the profligate consumption of fossil fuels that threaten them, than those Northerners have for intervening in the South on whatever "environmental" grounds (Dalby 2007b).

1.4 Anthropocene Security?

Much of the discussion of climate change in the years since the Brundtland Commission report has been about mitigation or adaptation with many environmentalists reluctant to deal with the adaptation agenda for fear of distracting attention from the pressing needs to reduce fossil fuel emissions. But as numerous recent reports (UNEP 2007) that have garnered so much media attention of late make clear, a substantial disruption of the climate system is already underway. The emissions over the last few centuries and especially in the last few decades will cause ecological changes even if carbon fuel consumption stopped immediately (Steffen et al. 2004). The sheer scale of human chances to the biosphere has now made many geologists accept that we are effectively living in a new era called the Anthropocene. This suggests that both adaptation and mitigation are needed, but implementation requires an approach that combines both so that adaptation is planned while using technologies that mitigate emissions. The solar panel is emblematic of what is needed; energy with no inputs and no emissions that can run anywhere there is sunlight no matter what disasters and disruptions may occur elsewhere.

Thinking about security as requiring both simultaneously is now necessary if ecology and the changing biosphere are the taken for granted context for research and policy formulation. The term Anthropocene is significant because it captures in a single evocative word the new condition of humanity. The Anthropocene marks the new human condition in that we are actively remaking the ecological context of our times. The environment is no longer out there, separate from human activities, but rather we are living in biosphere that we are actively remaking. This is not only a matter of atmospheric change, and climate modifications as a result of the emissions from "carboniferous capitalism" (Dalby 2002) but also in terms of land use changes which continue to change the vegetation and animal life of the planet dramatically, pollution and fishing in the oceans, the introduction of new chemicals into all parts of the biosphere and such things as the replumbing of most of the major rivers of the planet. Insecurity is now a matter both at the largest scale in which we are changing the atmosphere and probably making extreme weather events more frequent, and also now of the vulnerabilities manufactured by the artificial and urban landscapes we increasingly live within.

All of these considerations apply in relation to disaster when preparations before, and reactions in the early days afterwards matter greatly to affected people. While disasters might not apparently be understood as being part of environmental change, and hence not appropriate matters for consideration in a discussion of policy and peacebuilding, the old joke about disasters simply being fast environmental change, and environmental change being slow disasters, suggests a direct relevance precisely because the vector of change is usually some form of "natural" phenomenon. Wars and political instabilities are also forms of disaster too, but the disruptions of the biosphere, of which climate change is only the most high profile, increasingly suggests that storms and vulnerabilities due to people living in places subject to the ravages of "natural" events, are increasingly a matter of artificial environments in which vulnerability due to social and political phenomena plays itself out. In a world of lengthy food chains and possibly more severe hurricanes (Shepherd and Knutson 2007), the context for change is increasingly artificial; this is the point about the Anthropocene as a new geological era; it might also be understood as the physical manifestations of globalization, a phenomenon that is about moving materials quite as much as moving money or changing identities (Dalby 2007c).

Globalization is a matter of constructing new urban spaces, ones where the majority of humanity now live. It is a physical process of environmental change with unavoidably challenges the conventional thinking about security (Brauch et al. 2008). Vulnerabilities and the possibilities of either cooperation or peacebuilding, or conflict and violence play out in these increasingly artificial landscapes. While peacebuilding and environmental matters are usually understood in terms of rural matters and usually among the marginal populations of the global south, the Anthropocene suggests that as we become an urban species the disruptions we have set in motion on the large scale will play out in the artificial landscapes of our "Planet of Slums" to borrow Mike Davis's (2006) provocative formulation. But whether these slums are portrayed as the source of threats to the neoliberal economic progress of the future which require security policies to contain, or are seen as thriving human communities whose lot in life can be aided, and for whom timely infrastructure provision will be needed to help them survive climate disruptions, matters greatly in terms of how peacebuilding might now proceed.

1.5 Urban Vulnerabilities

In the summer of 2005 Hurricane Katrina disrupted the infrastructure of New Orleans and drew the attention of the world's media to the plight of the poor struggling with, and in many cases failing to survive, the floodwaters. The vulnerability of those without transport, epitomized by television pictures of desperate survivors clinging to rooftops as the flood waters swirled around them, brought home to many viewers the simple fact that disasters can strike anywhere and that those without cars are especially vulnerable in a city without a comprehensive public transport system.

The flooding also bluntly posed questions about sea level rise, increased intensity of hurricanes and the role played by climate change. So too the dredging of channels for oil tankers and pipelines, the reduction of wetlands around the city, and the construction of a fabricated landscape with little buffering capacity to absorb floods (Freudenburg, Graming, Laska, and Erikson 2007). Just as many Indian Ocean coastal communities had been rendered vulnerable to the tsunami's devastation at the end of 2004 due to the removal of coastal mangroves which traditionally act as a protection against waves and storm surges, the artificial landscape of Louisiana offered little protection to the residents of New Orleans. This was compounded by the failure of the inadequately maintained drainage canals and dikes that were undermined by the storm and that finally precipitated the worst flooding. Plans by the United States Corps of Engineers to upgrade the infrastructure had gone unfunded for years, despite repeated calls to shore up the dikes in a city that is slowly sinking ever further below sea level.

But few commentators watching the disaster unfold in Louisiana remembered the previous month's massive flooding in Mumbai. The larger causes of Mumbai's disaster are in many ways similar to the situation of New Orleans. The tendency towards heavier rainfall through the twentieth century is part of the story, but so too is the increased urbanization and the spread of concrete surfaces which enhance runoff into drainage systems, many of which were at least partly clogged with debris and garbage. Wetlands, forested areas and mangroves in the area have all been substantially reduced; like New Orleans the natural "sponges" in the area that can absorb rainfall have been diminished. Mumbai however is not below sea level and the floods drained away in the following weeks.

The political context of these victims of "unnatural hazards" however reveals a larger and important lesson, because it is the social and economic context of vulnerability in the aftermath of a hazard that determines if and how it turns into a disaster for the population. Where the poor were disparaged in the United States by the Bush administration and substantially blamed for their plight, in Mumbai the elites came to the opposite conclusion about the poor and marginal people who had banded together to help the flood victims there. "But what really captured the public imagination in the days following the floods were the selfless acts of young men conventionally seen by the middle classes as loafers, threatening the security of themselves and their families" (Anjaria 2006: 81). By

numerous acts of generosity noted by participants and the local media, their role in the city changed, and the politics of security were questioned:

"Until now, researchers have only understood this mobile population for its capacity for violence, but what July 26 revealed was its capacity for incredible acts of generosity and selflessness. And uncharacteristically, the upper classes acknowledged this reality. Slum dwellers, who only days earlier had been declared the greatest impediment to Mumbai achieving its global dreams, were now declared to represent the "true spirit" of Mumbai." (Anjaria 2006: 82)

Where public systems collapse spontaneous actions by people in a position to help others filled the gap. No martial law was declared, and while chaos reigned it wasn't marked by looting, riots or the need for troops.

The contrast with the media script of threatening poor people in New Orleans is noteworthy. Initial evacuation orders were heeded by most of the more affluent parts of the population who got into their cars and drove north away from the most dangerous impacts of the hurricane. But many of the poor stayed behind in the city. In this context: Michael Chertoff, Bush's Secretary of Homeland Secretary, made a striking remark. Defending his administration's decision to basically abandon those who failed to leave using their own transport to their own devices, and ignoring the fact that most poor residents stayed because they simply had *no means to escape*, Chertoff argued that "the critical thing was to get people out of [New Orleans] before the disaster. Some people chose not to obey that order. That was a mistake on their part".

Such rhetoric, backed by an almost complete absence of organised, public evacuation procedures, suggested one simple but powerful thing: if you can't get out of the city (like rich, suburban, auto owners) it's your fault. End of story. The escapees are normal, respectful, citizens. You're not. The socially Darwinist, individualist and deeply anti-urban ideology that underpins so much of Bush's neoconservative world-view is rarely revealed so succinctly (Graham 2006).

Here the poor were seen as a threat, and the authors of their own misfortunes, and hence to be despised rather than helped, treated as a security threat to property rather than as citizens whom the state has an obligation to protect.

But it is also clear that in the post 9/11 world, where neoliberalism has become one with the state in the American model of contracting out security functions, state functions and the traditional role of states in providing security and public health as well as assistance in the face of disaster, have been overtaken by technical practices and interventions of market and the military that are frequently deleterious to indigenous economies and patterns of subsistence living (Klein 2007). But adaptations to disaster, like the Cuban model where neighborhood planning and basic shelter provision have saved numerous lives (Sims and Vogelman 2002), suggest all sorts of possibilities for human security. But ones where survival networks and a mobilized citizenry are key, rather than the operation of commercial contractors and external interventions where that citizenry is seen as the problem to be controlled, rather than the active agents of resilient response to disaster.

1.6 Policy and Peacebuilding

In all the discussion of environmental security over the last few decades there is a remarkable absence of wars that are obviously caused by environmental factors. There is much violence and conflict related in numerous ways to economic and political change that has an environmental dimension, but in much of the scholarly literature since the Brundtland Commission report of 20 years ago it seems to be clear that the environment is rarely a direct and immediate cause for violence. The fact that this is the case seems to be the key to both the literature on peace parks and the broader discussions of environmental diplomacy and peacemaking (Conca and Dabelko 2002).

Precisely because environmental matters are important to many but not a direct cause of warfare suggests the possibility of conflict mitigation and peacebuilding. Hence international cooperation on such things as peace parks act as confidence building measures and establish patterns of cooperation which reduce the likelihood of disputes escalating to warfare (Ali 2007).

The neo-functionalist antecedents are a key part of the discussions of peace and regional integration in the international relations literature, but the point is that in many places environmental cooperation is a useful mode of confidence building. Shared resources usually require complicated arrangements to deal with locale specific issues. Peace is not imposed by fiat in these conditions, but worked at from the local context to larger institutions. Would that the drafters of the Framework Convention on Climate Change, and much more specifically the Kyoto protocol, had understood that overarching global agreements on environmental matters are more likely to be built through a series of bottom up initiatives rather than an attempt to incorporate everything that is relevant into one formula that can be applied to the whole globe (Prins and Rayner 2007)!

Asking the right question in the first place is key to good policy making, and assuming that the question is clear in advance seems to be one of the key problems with much of the scholarly and policy literature on environmental conflict for the last two decades. Kahl's (2006) summary of the environmental conflict literature struggles bravely to encapsulate the whole debate, but at the end the lack of a common understanding is not surprising given the multiplicity of scholarly approaches involved. Precisely what question is posed is of course crucial, and here, where policy agendas drive research, as they so frequently do, the question of who poses the question and how it fits larger institutional mandates cannot be avoided. Thinking through the connections in commodity chains and the violence that might be averted by international political strategies to manage the commodities is part of the puzzle (Le Billon 2007). But likewise an explicit focus on peacebuilding here is also relevant; not least because of the fairly robust empirical finding, especially in the investigations of water wars, that environmental matters frequently lead to cooperation, not least because of the geographical and physical attributes that make violent conflict counterproductive for all concerned (Giordano et.al 2005).

Where in the larger ecological flows that are increasingly being modified and redirected by human activities, a particular issue lies, seems to be the key consideration for discussing security or peacebuilding; in the words of Wolfgang Sachs and his colleagues (2007) a "fair future" requires tracing these connections and simultaneously reducing over-consumption while ensuring sustainable commodity provision in the global economy. Hence empowering sustainable agriculture while reducing the disruptions by huge mining projects simultaneously tackles poverty in the case of agricultural development, while avoiding the potential for disruptions causing conflict over environmental damage and compensation. Thinking in terms of these kinds of ecological flows changes the context for peacebuilding by focusing not just on local institutions but on the larger economic and ecological connections to conflict and the possibilities of sustainable development directly linked to ecological considerations.

On the largest scale this argument connects up with concerns about warfare in the Middle East and the case for renewable energy reducing American dependence in particular on imports of petroleum. The green economy argument suggests that decarbonizing the global economy has the double benefit of reducing the violence over resource extraction and simultaneously reducing the disruptions caused by greenhouse gas emissions and climate change (Paterson and Dalby). Likewise in the case of disruptions not being dependent on lengthy supply chains improves resilience. Disconnecting metropolitan reliance on essential petroleum supplies from the periphery is a sustainable security strategy from both ends!

Which suggests that in one important sense peace is about building, about institutions but also about structures, energy consumption, and the links between rural and urban places in an interconnected world (Sachs and Santarius 2007). Peace building is literally about building things

that are sustainable without having violent repercussions either locally or at a distance. Thinking about buildings, and the possibilities of structures that draw on local materials rather than distant concrete factories, solar energy rather than fossil fuels, and local social survival mechanisms rather than the instant solutions of foreign expert contractors, suggests a much more ecologically sustainable mode of providing security than many of the modernizing modes of development that are still practiced by many neo-liberal contractors and state elites.

1.7 Conclusions

All of which suggests the importance of an ecological interpretation of events and human populations, rather than a top down state centric view of things where the government runs things from the capital city. In James Scott's (1998) terms "seeing like a state" is in many ways still a problem where urban elites manipulate rural matters for their own enrichment. Ecological metaphors of social organization suggest that adaptability and innovation without control from central government may offer many possibilities. Traditional social networks and marketing arrangements have much to offer in a crisis. But these may be foreclosed so long as poor urban and rural populations are understood as a security problem that needs to be managed as either a state building project or as peoples in need of modernization by contemporary neo-liberalism.

In so far as states and municipal governments provide basic infrastructure, sanitation, a public health system and make plans for emergency assistance where disaster strikes the human security of the population is enhanced (Brauch 2005). But where the poor in their slums are understood as a threat to a political order that emphasises international markets, and development as the promotion of enclaves of modernity, foreign based tourism and commodity exports, then the militarization of development is likely to remain a temptation for state elites. All the more so where such strategies can be sold abroad as a contribution to contemporary geopolitical struggles against "terrorism". For this reason the sooner the "war on terror" is called off the better; the militarization of many conflicts in the global periphery is more likely to make matters more difficult rather than facilitate peacebuilding.

By now it is clear that the causes of many of the disruptions are not indigenous factors in the South, but rather the global economy and the strategies of the rich and powerful to sustain their current modes of urban consumption. We are increasingly changing those contexts and making artificial connections between people across the globe as we transform the biosphere (Steffen et al. 2004). This new recognition of the interconnectedness of our collective fates has given rise to a discussion of the new geological circumstances of humanity which is now living in the Anthropocene. Now we need to understand the global economy as a new forcing mechanism in the biosphere, not something separate from an external "environment". In Bruno Latour's (2007) terms we need earthly sciences, and a politics that explicitly has a policy for such unlikely things as the Gulf Stream, if the ecosystems of the planet are not to be so drastically disrupted as to make civilization as we know it impossible.

Interconnections are key to all this, both between places and between humanity and the biospheric context that we are collectively remaking. This requires taking ecological science and the theme of the Anthropocene much more seriously in how we rethink security because we are literally building our collective future in a changing biosphere (Dalby 2007d). Our conceptual formulations of both environment and security thus need some updating. In light of the scientific discussions in earth system science it seems that while the poor in the South continue to struggle with matters of sustainable development, the priority for Northern consumers is now one of reversing the Brundtland Commission's formulation and focusing instead on the urgent need to "develop sustainability".

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2 Fighting in the Desert? Conflict and Resource Management in East African Drylands

Tobias Hagmann[6]

2.1 Introduction

Expert opinion has it that climate change is a major cause of violent conflict in the semi-arid and arid lowlands of sub-Saharan Africa. Prominent politicians and public intellectuals have identified climate change as a culprit of inter-group violence in East African drylands. Asked about the impact of land degradation and desertification on the Darfur conflict, Jeffrey Sachs, the director of Columbia University's Earth Institute, determined that 'but for the environmental stress; I doubt this would have exploded' (Rosenthal 2007). Sachs is not the only one to point fingers to the alleged nexus between climate change and political upheaval. The United Nations' Intergovernmental Panel on Climate Change (IPCC) chairman Rajendra K. Pachauri recently speculated that 'climate change has the potential to be a problem for the maintenance of peace' (Flynn 2008). Margaret Beckett, the former British Foreign Security, established that 'a failing climate means more failed states' (Marcus 2006). Following the publication of major global environmental assessment reports such as the Millennium Ecosystem Assessment (2005), the British government sponsored Stern Review (Stern 2006) and the IPCC (Boko *et al.* 2007) numerous commentators have argued that climate change has and will fuel conflicts, particularly in sub-Saharan Africa. Although little validated scientific knowledge exists about the links between climate change and conflict (Nordås & Gleditsch 2007), authors have warned about the 'double-headed problem of climate change and violent conflict' (Smith & Vivekananda 2007:4), which developing countries will face in the future.

The alarmist rhetoric about the threatening impacts of climate change as drivers of violence in dryland sub-Saharan Africa rejoins earlier debates about the causal links between environmental degradation, land use change and conflict in Africa (Suliman 1999). Initially, the discussion about resource-based conflicts in African lowlands was triggered by fears that increasing desertification and the negative impacts of global environmental change disrupt pastoral livelihoods, diminish life-sustaining resources and thereby exacerbate violent conflicts (Baechler 1994). While individual studies found ample evidence for quantitative (frequency) and qualitative (dynamics) changes in resource related conflicts in pastoral areas, the causal links between environmental change, conflict and cooperation remain strongly contested (Barnett 2001, Dalby 2004, Hagmann 2005, Peluso & Watts 2001). Much of the environmental conflict literature - most prominently Homer-Dixon (1999) - transpired the neo-Malthusian assumption according to which demographic growth coupled with environmental degradation leads to resource scarcity, which in turn fosters inter-group conflict. While this rather outdated neo-Malthusian notion of environmentally induced conflict has been severely criticized on methodological and conceptual grounds (Gleditsch & Urdal 2002), current debates about climate change have once again rehabilitated the idea that scarcity of renewable resources, namely land and water, leads to conflict. This scenario is supported by climatologists who predict that climate change will reduce the length of growing seasons, add pressure on water availability and accessibility, increase deforestation and desertification and lead to less and more erratic rainfall in African drylands (Boko *et al.* 2007).

This paper refutes the idea that violent conflict in pastoral areas can be understood as a direct function of resource availability as determined by climate change. Instead of reiterating theoretical critiques to the environmental conflict thesis and scarcity driven explanations of violent conflict fostered by climate change (Hagmann 2005), I draw attention to how pastoralists manage conflicts

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and resources. While past and present debates have been obsessed with tracing the causal links between a given condition of the biophysical environment and violent conflict, few authors have taken into account conflict and resource management institutions as dependent variables that account for the emergence of organized violence in semi-arid lowlands. My central proposition here is that relations of both conflict and cooperation over natural resources must be analysed to understand and make a meaningful contribution to conflict transformation. This requires an engagement with the ecological, socio-economic and political characteristics of pastoral production systems as they are typically found in the East African lowlands and border regions.

2.2 Institutions for conflict and resource management[7]

Which institutions shape pastoralists' conflict and resource management practices in the East African lowlands? To answer this question characteristic features of the ecological and political space in which transhumant livestock keeping is embedded must be recalled. It is vital to understand pastoral conflict and resource management strategies on the background of their wider natural and social context. In this respect the 'new range ecology' school has challenged dominant conceptions of rangeland management and ecology and pastoral development (Behnke 1994, Ellis & Swift 1988, Niamir-Fuller 1999a, Scoones 1996). New range ecology scholars have refuted historically popular views according to which nomadic pastoralism is economically irrational and ecologically unsound. By drawing attention to the non-equilibrial nature of arid and semi-arid ecosystems, they have argued that ecosystems regularly change from one condition to another (Niamir-Fuller 1999b). According to this interpretation, highly variable rainfall, vegetation and resource consumption patterns must be viewed not as irregularities, but as defining features of African and other drylands. Despite new range ecologists' fundamental rethinking of the logic that governs human-nature interactions in dryland pastoralist production systems, policy-making in pastoral areas often continues to be informed by assumptions of herders' economic irrationality as famously stated in Hardin's (1968) 'tragedy of the commons' writing.

New range ecology's central tenets can be summarized as follows. First, extensive resource use as evidenced by high livestock mobility and opportunistic grazing is a rational response to the seasonally and spatially variable resource availability that is so characteristic of drylands (Behnke 1994). Second, in their daily management decisions pastoralists face different types of uncertainty as a result of drylands' climatic and ecological variability. Third, pastoral communities' land tenure rules reflect the existence of overlapping and dynamic resource claims that do not fit static boundaries of clearly demarcated property rights. Fourth, property and use rights of key natural resources of the pastoral economy are highly socialized and are part of layered property rights regimes. Finally, resource ownership in pastoral production systems manifests itself in negotiated access rights instead of permanent property rights. These insights of the new range ecology school are of crucial importance when gauging the effectiveness of conflict and resource management institutions. One can assume that practices, patterns and policies that are in line with drylands' non-equilibrial nature and their highly socialized property rights are more amenable for peaceful conflict and resource management than those practices, patterns and policies that contradict or disrupt them.

Pastoralist institutions may contribute to conflict prevention and transformation for different reasons, but primarily because they enable cooperation and because they determine resource access. This point is made by Cleaver (2002:15) who argues that 'institutions of co-operation are embedded in everyday relations, networks of reciprocity and the negotiation of cultural norms'. An example illustration of this is provided by Ensminger (1990) whose ethnography of Orma herders, their changing property rights and incorporation into the Kenyan state, underlines how institutions enable

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[7] This section draws heavily on chapter 3 of Hagmann (2006).

more cooperative forms of exchange. Goldschmidt's study of tribal societies' 'institutions of peace' highlights how pastoralists resolve inter-group competition and tension non-violently. Similarly, institutional rules play an important role in regulating cooperation and competition over the use of common-pool resources such as rangelands (Ostrom 1990). Consequently, a host of diverse and interacting institutions mediate relations between social actors and their natural environment as well as the way these actors manage natural resources (Leach *et al.* 1999).

Bearing in mind these theoretical tenets, it becomes clear that conflict and resource management institutions have different purposes and that they are an essential part of the everyday management of pastoral affairs (Swift 1996). For example, conflict resolution, marriage or inheritance rules are as relevant for resource management as they are to govern inter-group, gender and family relations. In cases where violent conflict has become protracted, a reorientation of the institutional rules of resource use is often a precondition to allow pastoralists access to water points and rangelands (Lane & Moorehead 1996). Livestock keepers manage conflicts by establishing alliances, through *ad hoc* adaptations, reciprocity as well as informal sanctions or simply by avoiding disputes with competitors (Braukämper 2000, Niamir-Fuller 1999a). Resource management institutions are thus an integral part of everyday conflict prevention, management and settlement. In return, pastoralists' conflict prevention, management and settlement strategies are an integral part of their everyday natural resource management practices.

A persistent intellectual challenge to institutionalist interpretations of sub-Saharan politics and ecology is the fundamental opposition that is often drawn, both in scholarly and in folk discourse, between 'modern' and 'traditional' institutions. For example, Leach *et al.* (1999) distinguishes between 'formal institutions' such as statutory law, which requires exogenous enforcement, and 'informal institutions' such as customary norms, which are endogenously enforced. Although many authors have criticized this static differentiation as unhelpful, it remains a powerful schema to interpret the history, rationality and functioning of institutions in developing countries. In her sophisticated discussion of this topic Cleaver (2001:29) warns against opposing a 'realm of "traditional" informal, culturally and socially embedded institutions' to 'a "modern" domain of rationally designed committees and formal structures'. Given the adaptability of customary norms and practices on the one hand, and the often 'invented' nature of 'traditions' on the other hand (Hobsbawm & Ranger 1983), it seems more prudent to define institutions not in dichotomous terms, but as historically evolving norms and practices that contain multiple influences.

This latter point is strongly made by legal pluralism scholars who emphasize the interconnectedness of plural social and normative orders (Merry 1992) and the necessity to consider 'the whole configuration of legal plurality' (von Benda-Beckmann *et al.* 2003:305). While the state claims a monopoly of legal regulation over society, bureaucratic, customary, religious and kinship institutions coexist in sub-Saharan Africa and elsewhere, offering multiple procedures and repertoires for conflict management. Dialectic relations exist between socially embedded rules (or what is commonly referred to as 'customs'), customary norms recognized by the state and statutory law (von Benda-Beckmann 2001). In parallel, these different legal repertoires not only contradict each other, but frequently constitute 'overlapping and polycentric forms of governance' (Meinzen-Dick & Pradhan 2001:15) that influence conflict and resource management. The following section summarily reviews the contemporary dynamics of these conflict and resource management practices in greater detail and with reference to East African drylands.

2.3 Transformations of the pastoral political economy

Violence in pastoral areas must be understood on the background of the numerous long-term transformations that affect sub-Saharan African drylands. Herder societies and economies have been gradually transformed by population growth, the expansion of agro-pastoralism, the multiplication of water points, recurrent draughts, the institutionalization of humanitarian aid, the individualization of rangelands, forced and voluntary in-migration and population movements as well as increasingly

sedentarized lifestyles (Anderson & Broch-Due 1999, Fratkin & McCabe 1999, Little *et al.* 2001, Markakis 2004). Conflicts over dryland resources are embedded in evolving natural resource management practices and changing political frameworks that result from these transformations. The historical and ongoing diversification of livelihoods and political authorities in extensive production systems has weakened internal group cohesion and rendered collective action more complex.

A common denominator of these transformations of the pastoral political economy is the commoditization of the biosphere as 'new' natural resources are drawn into regional and global markets. While East African livestock has been commoditized decades ago in the form of export goods (Samatar 1992), a wide range of renewable and non-renewable resources situated or produced in the lowlands are currently absorbed by local and transnational economies. In the coastal regions of the Horn of Africa dryland forestry, particularly *acacia* trees used for charcoal production has become an important energy source that is sold to Arab Gulf States (Lindenback 2001). Intensification of land use for agricultural cultivation and fodder production in increasingly individualized and enclosed rangelands is another indicator for commoditization. Across East Africa transhumance, seasonal migration and reciprocal grazing rights have been severely undermined by the fragmentation of rangelands and the spread of privately owned land enclosures. Similar trends are observable in the case of water used for irrigation, animal and human consumption, whose access and use often hinges on technological investments that are required for drilling wells or pumping water for flood irrigation. Finally, a number of lowland regions including southern Sudan and western and eastern Ethiopia hold significant reserves of fossil energy, which are exploited commercially.

Another factor of change in East African pastoral economies is the growing involvement of development and humanitarian aid. Following decades of neglect, local and international development organizations have recognized pastoralism and drylands as areas of targeted intervention in Ethiopia, Kenya and Sudan. As a response to the devastating droughts that hit the Sahel belt in the 1970s, 1980s and 1990s donor sponsored relief and rehabilitation programs were gradually expanded to the lowlands. Particularly humanitarian aid in the form of food aid has become a recurrent phenomenon. In many cases food aid supplements household incomes, but it also raises the specter of increasing dependency on donor sponsored 'hand-outs' (Sandford & Habtu 2000). In addition to routine food aid deliveries, Ethiopian pastoral communities are more and more benefiting from cash transfers in return for labor based public works, which are hoped to address the structural causes of food insecurity and chronic vulnerability.

Initially celebrated as a policy achievement, the inclusion of pastoralism on the development agenda has produced paradoxical outcomes. On the one hand, pastoralism as a lifestyle and economic activity has gained public recognition. On the other hand, herders' interests are represented in national capitals by officials and development workers who often do not originate from pastoral communities and/or are members of the educated urban elite (Oxby 1999).

Recent research on pastoral conflicts in East Africa demonstrates that local institutions for conflict and resource management are increasingly dominated and transformed by the expanding nation-state (Hagmann & Alemmaya 2008, Hogg 1997, Salih *et al.* 2001). This process is not a zero sum game as it reconfigures the ways in which the state and pastoral groups engage in politics while the historic, but not linear, process of state expansion unfolds in the Horn of Africa's semi-arid lowlands. This finding is in line with Markakis' (1994:217) earlier observation that the state represents a major bone of contention for conflicts in the East African lowlands 'because it controls the production and distribution of material and social resources'. Most inter-personal and inter-group disputes in pastoralist areas, both violent and non-violent, are adjudicated by elders. Customary conflict resolution institutions often rely on blood compensation payments to reconcile warring groups. This is the case of the Afar in Djiboutiand Ethiopia (Kassa 2001) the Karrayu Oromos in Ethiopia

(Mulugeta 2007), the Somalis in Somalia, Djibouti, Ethiopia and Kenya (Lewis 1999 [1961]) or the different tribal groups of (partly) Arab descent in Darfur (El-Battahani 2002).

East African governments have seldom been able to secure lasting peace by recourse to legal means or effective policing in their lowland regions. Attempts to expand the outreach of state organs, particularly police, courts and jails to more remote areas, have been met with limited success. Often local administrations lack popular acceptance and the required resources (transport, armed forces etc.) to play a meaningful role as mediators and conflict managers. With the exception of urbanized populations, pastoralists in many instances prefer customary conflict resolution institutions over the formal justice system to settle disputes. The avoidance of the state's legal system is particularly visible in Ethiopia's pastoralist areas. To cite an example, Seid and Jotte (2004:12) report that out of a total of 215 criminal cases (homicide, attempted murder, armed robbery) observed in 2002 in the Korahe zone of Ethiopia's Somali region only six were dealt with by the courts on the basis of statutory law.

Various recent studies have documented the failure of Ethiopian local and regional administrations to provide 'lasting solutions' (Gedi 2005:46) to longstanding resource conflicts at communal level. In the case of the Boran-Degodia conflict rather than calming the situation government interventions 'had the effect of escalating the conflicts' (Abdullahi 2005:15). The following paradox is thus observed; although the state perceives outbreaks of physical violence in its pastoral lowlands - most notably cattle raids and associated violence - as a challenge to its sovereignty and monopoly of violence, it does not have the appropriate means to resolve these conflicts durably (Mulugeta & Hagmann 2008). Furthermore, in their attempts to contain and resolve resource-based and other inter-group conflicts, Ethiopian state interventions are spatially limited, inclined towards coercion and rarely long-term oriented (Hagmann & Mulugeta 2008). While herders' customary conflict management institutions have been eroded by the transformation of the pastoral economy and increasing state incorporation, government sponsored conflict resolution often is not very effective. The result is a 'crisis of reconciliation' (Abbink 2000) as pastoral communities can rely neither on state nor on customary institutions to resolve conflict.

2.4 Conclusions

Despite its intuitive logic, the assertion that climate change fosters resource scarcity driven conflicts in sub-Saharan African drylands is over simplified. While changing qualitative and quantitative parameters of local resource pools certainly have an impact on human behavior, a linear causality between the two does not exist. Rather human agency, or what is commonly refereed to as 'adaptation' in the human ecology literature, represents the intervening variable between environmental change and inter-group relations. As this paper has demonstrated both theoretically and empirically, conflict and resource management institutions and practices determine whether and how conflicts (de-)escalate. Although conventional wisdom associates resource scarcity with violence in East African lowlands, local practices of resource sharing arrangements often ensure peaceful coexistence (Bogale & Korf 2007, Eaton 2008). Changing conflict dynamics in East African lowlands are primarily the result of the concomitant break-down of customary institutions and the inability of central and local governments to enforce communal property rights. The result are *de facto* open-access tenure regimes that benefit groups with higher bargaining power as they are better placed to capture strategic resources of the pastoral economy.

The analysis of the institutional, social and ecological intricacies of violent conflict in African drylands reveals the continuous importance of politics as the main explicative variable for inter-group tension. Violence among pastoral and agro-pastoral groups must not only be seen in the context of changing local institutions and political economy, but is fundamentally *political* and is closely associated with everyday experiences of marginalization, exclusion and oppression. Whilst the environmental conflict and climate change conflict hypotheses impute causal power to environmental change, political dynamics are as important. Relations between the state and pasto-

ralists, between herders and farmers, and between competing resource users are conditioned by political circumstances that define who is entitled to material opportunities, decision-making and representation. Contemporary conflicts in East African lowlands are the product of competition over urban real estate, multi-party elections and state budgets as much as struggles over rangelands and water wells (Hagmann & Mulugeta 2008). Strategies that aim at conflict transformation must consider the variegated nature and modernity of contemporary violence in sub-Saharan Africa. Herders do not simply fight over the desert because they are animated by subsistence need, but because they pursue politically, culturally and economically rational agendas.

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3 It's about More Water. Natural Resource Conflicts in Central Asia

Christine Bichsel[8]

3.1 Introduction

A body of academic and policy-oriented literature began to focus on the danger of conflict in Central Asia as of the late 1990s. While differing in details, the authors concurred that the Ferghana Valley has a high potential for violent conflict. They base this potential on evidence of past violent episodes and/or present tensions that may yield in violence. In other words, these writings depict the Ferghana Valley as a 'host of crises' (Slim 2002) or a 'flashpoint of conflict' (Tabyshalieva 1999:vii). The literature argues in general lines that the potential for conflict is constituted by a broad array of interlinked conflictive factors, including social, political, economic, religious, demographic, military, and criminal ones. A core concern of this literature is inter-ethnic conflict over natural resources, aptly summarised by Slim (2002:511): 'In the short term, they [aid agencies] must focus on the localities where water-based conflicts have taken on an ethnic character and which, if not addressed, might provide the spark for region-wide interethnic violence'. This literature on conflict in the Ferghana Valley stressed the need for interventions by international aid to avert widespread violence resulting form this potential.

This concern was taken up by several donor organisations in early 2000, including the three aid agencies on which this article focuses. First, the Swiss Agency for Development and Cooperation (SDC) is a governmental donor organisation which coordinates international development activities of Switzerland as a part of the Department of Foreign Affairs. Second, Mercy Corps International (Mercy Corps) is an international NGO which acts in this case as an implementing agency for the United States Agency for International Development (USAID). Third, the United Nations Development Programme (UNDP) is a multilateral aid agency and represents the UN's global development network in Central Asia. While these three agencies have implemented a multitude of projects in Central Asia, for this article I base my insights on three only. With regard to SDC, this is the 'Regional Dialogue and Development' (RDD) project active over the period 2002-2005 in Kyrgyzstan, Uzbekistan and Tajikistan. In the case of Mercy Corps, I look into the 'Peaceful Communities Initiative' (PCI) implemented in Kyrgyzstan and Uzbekistan, and later also Tajikistan during 2001–2006. For UNDP, I focus on the 'Preventive Development Component' (PDC) and later 'Preventive Development Programme' (PDP) conducted over the period 2000-2005 mainly in southern Kyrgyzstan, but at a later stage also in northern Tajikistan. My main argument is that the three projects rest on a misconceived interpretation of the conflicts upon which they were devised to act. Because they see conflict as an endemic element in village life and because their perspective is strongly influenced by a functional interpretation of the issue of scarcity, aid agencies in this context fail to take into account the political dimension of social change, and do not pay enough attention to the issue of power in natural resource conflict management.

3.2 Engaging with conflict at the village level

With these three projects, SDC, UNDP and Mercy Corps aimed to mitigate conflicts over water and land between rural communities differing in ethnic affiliation. The three aid agencies largely subscribed to a similar approach, although it varied in detail, implementation, and the weight given

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to singular components. It centred on the combination of the following three components: (1) building or rehabilitating infrastructure; (2) establishing and training community-based organisations (CBOs); (3) fostering joint social activities between the adversarial groups. The first component entails the building and rehabilitation of drinking water and irrigation infrastructure, but also healthcare, educational and recreational facilities. It should help communities at loggerheads to resolve the structural causes of conflict, related to the scarcity of natural resources and to the dysfunctional state of infrastructure. The second component consists in establishing and training CBOs for each conflict party. By means of CBOs, communities should be enabled to mobilise and constructively address the conflict at stake, turning it into a more peaceful relationship. The third component involves fostering joint social activities between the adversarial groups. It entails the creation of social spaces for conflict parties or parts of them to interact, such as youth clubs, sports competition or festivals. Cultivating communication, trust and personal friendship is expected to improve inter-group relations.

SDC, UNDP and Mercy Corps implemented this approach numerous times in the Ferghana Valley. In most cases, the social unit for implementation included two or several village sharing an irrigation system, within which conflictive claims over water and land had arisen. The three aid agencies thus conceptualised conflict as existing in a limited spatial extension expressed by the villages and their adjacent land, as well as in a confined scalar dimension in that its roots were seen as residing only in the relationships between the conflict parties. In my exploration, I follow this particular perspective adopted by the aid agencies and explore their approach based on three such cases in the Ferghana Valley. The first case focuses on the three villages of Pülgön, Khalmion and Alga in Kyrgyzstan. The three villages share a large irrigation system on the border of Uzbekistan. While in particular Khalmion is likely to have a very long history of irrigated agriculture, the main canal infrastructure now in place was built during the 1970s. With independence from the Soviet Union in 1991, the overall share of water available for the irrigation system became dependent on inter-governmental agreements between Kyrgyzstan and Uzbekistan. Disputes over irrigation water are a frequent occurrence in this irrigation system. They have occurred and do occur between upstream and downstream users, and also between Kyrgyz and Uzbek populations in this area. Yet, so far, governmental agencies as well as water users have managed to successfully resolve these disputes.

The second case centres on the three villages of Khush'iar in Uzbekistan, and Sogment and Charbak in Kyrgyzstan. They came into public attention with a violent escalation of the conflict in spring 2005. The three villages share a complicated cross-border irrigation system whose main canal dates back to the period of the Second World War. The system was enlarged with additional pumps and canals during the 1970s in order to satisfy the growing need for water. Rather than for the considerable amounts of water transported by the main canal, disputes occur over water distribution from a small spring. These disputes have been framed by analyses in terms of animosities between Kyrgyz and Tajiks which inhabit the three villages. Mercy Corps has addressed these disputes during 2002-2003. The third case entails the two villages of Aksai in Kyrgyzstan and Tojikon in Tajikistan. It is, compared with the two cases described above, the most long-standing dispute over water and land. At the same time, the conflict resulted in the largest number of casualties over time. The infrastructure of the irrigation system in place was built between the late 1960s and early 1970s. However, disputes between Aksai and Tojikon date further back into the Soviet period and can be traced to the 1930s. The conflict is often explained in terms of long-standing inter-ethnic animosities between Kyrgyz and Tajiks. The dispute between Aksai and Tojikon has been addressed by two aid agencies in the focus of my research (see Bichsel 2009). In 2003-2004, SDC and UNDP attempted to resolve the conflict over irrigation water.

A conceptual analysis of the aid agencies' approach to conflicts over land and water shows that they are guided by three basic assumptions. First, SDC, UNDP and Mercy Corps assume that competition over limited water and land may divide communities along ethnic lines. They expect that economic deprivation and unsatisfied human needs lead people to resort to violence. The causal link between increasing resource scarcity and the occurrence of inter-group violence follows a hypothesis in

environmental conflict or environmental security research on mainly intrastate conflict. During the 1990s, several research projects established a causal relationship between the environment, scarcity and violence, however mediated by context factors (see for example Baechler 1998; Homer-Dixon 1996, 1999). Thus, in the aid agencies' approach, water and land scarcity becomes the explanatory factor linking irrigation and inter-group violence, resulting from mismanagement, socio-economic deterioration and demographic pressure. They attempted to remedy scarcity by means of improved infrastructure which should supply additional water.

Second, SDC, UNDP and Mercy Corps state that violent conflict is a dysfunctional social condition and should be transformed into a peaceful state by non-violent means. For this, they subscribe to the concept of conflict transformation (Lederach 1995; Miall 2004; Mitchell 2002). Within this concept, they suggest that behavioural, relational and structural changes should bring about peace. In terms of behavioural changes, the aid agencies expect that the conflict parties need to adopt moderation, tolerance and affect control. Relational changes should be achieved through increased contact between the groups at loggerheads, therefore reducing prejudices and improving social relations between them. The three aid agencies foresee that joint social activities should bring about such change. Structural change, finally, should alter the very constitution of society which gives rise to or supports the continuation of conflict (Miall 2004:70).This faulty constitution is located in the socio-political construction of the state. Civil society should therefore foster more democratic and peaceful governance. However, the aid agencies also attempt to tap on the local potential for peace in the form of traditional institutions (Lederach 1995).

Third, the three aid agencies expect social change to happen with the emergence of specific forms of power. This idea is expressed most distinctly when they speak of the need for empowerment that, in their view, bears the potential for change. Such power should result from specific forms of social interaction which brings to life associational power. Through participatory procedures, the conflict parties should be empowered to exert collective action for the public good. The aid agencies locate such power to a high degree in individual members of a community. They expect power to increase with the successful pursuit of individual and collective goals, not conditional upon prior changes in structures and systems (Mohan and Stokke 2000:249). At the same time they expect that with the emergence of 'civil society', this power may exert pressure on autocratic and unresponsive states and thereby support the desired change towards a more democratic governance which should foreclose violence. The establishment of CBOs is central for such change.

3.3 Scarcity as a social and political issue

My empirical data, stemming from the three cases presented, provides insights for a critical discussion of the there basic assumptions outlined above. I have outlined the conceptualisation of the link between population growth, the environment and conflict that the aid agencies bring forward. They posited, as it has been suggested, that 'grievances' arising from 'scarcity' divide groups along ethnic lines and drive them to adopt violence. The empirical analysis showed that there were moments in all three cases when people apprehend water as scarce. Yet, as the detailed explorations of social relations within irrigation systems show, at closer sight the phenomenon defies easy definition and generalisation. First, the experience of 'scarcity' is not simply an overall characteristics of an irrigation system, but appears in temporally and spatially discrete instances. Second, 'scarcity' is far from being a merely natural condition. It results from local institutional contexts but is equally embedded in shifts of larger political and socio-economic networks over time. Third, the experience of 'scarcity' is not an objective dimension. The meaning that people attribute to it cannot be understood outside specific economic, political and cultural contexts. 'Scarcity' is thus socially as well as naturally constituted, and a result of complex human interaction (see also Barnett 2000; Hartmann 2001; Timura 2001).

For irrigation systems, socially constituted water scarcity is often attributed to human needs or greed. In this view, human greed leads to depriving others of their water, while through human

needs the phenomenon 'scarcity' comes into view. My research has shown that human agency in relation to water and meanings attributed to it are complex, and the practice of upgrading one's water supply at the expense of others is not easily understood as greed that results in needs. On the one hand, such a practice may characterise human voraciousness, instructively pointed out by the following Kyrgyz saying, which states that 'Even if one's stomach is full, one's eyes are still hungry'. On the other hand, the same practice may have its motivation in human foresight and precaution, when water is hoarded to provide for the 'black day', which is characterised by the inherent uncertainty about water provision in the system. The proximity of the two possible explanations - that may furthermore not be mutually exclusive - blurs the boundaries between needs and greed, and show furthermore the relativity of the two concepts.

Moreover, it is important to ask to whom 'needs' and 'greed' is attributed. My research has shown that water distribution does not necessarily constitute or divide groups along ethnic or kinship lines, but is often rather based on residential or territorial collectivities. Yet, this distinction is at times obscured by the fact that residential and ethnic groups coincide. Furthermore, in the case of water, solidarity is contextual and temporal, and may not automatically arise as often presumed. In relation to this, it is important to note that dimensions of irrigation systems often include formal, ideological discourses of how it should work, descriptive accounts of how it actually works, and, again differently, the actual social practices that take place (see also Hunt and Hunt 1976:392). Therefore, monolithic representations of groups should not be taken for granted, neither in relation to water nor with regard to the very nature of kinship and ethnicity. The diffuse nature of 'scarcity' also questions universal forms of causalities proposed to arise from them. Experiences of 'scarcity' lead to numerous social responses that do not imply violence (Barnett 2000:283). At the same time, competition for water is a distinct reality during the irrigation season. Yet again, daily skirmishes and fights that arise from such competition should not be mistaken for inter-group violence, since the latter follows a different logic. The complexities of the conflict escalation show that such processes are essentially cultural and political work and entail much more than just a response to a state of a natural resource (Schröder and Schmidt 2001). Furthermore, the close scrutiny of interpretational and representational politics in the course of escalations forms renders the very idea of linear, unidirectional causality chains problematic.

Yet causality should not easily be disbanded, as violence is often discussed as a symptom to find causes and cures (Feldman 1995:226). Explanations of violent events may not unearth actual causalities, but provide crucial insights into how people assert situations and how they attribute meanings to what happens. Moreover, they may express deeply held values at the core of the dispute. To illustrate this, I turn to the violent escalation that took place between Aksai and Tojikon in 1975. In an interview, an elder from Aksai remembered how residents of Tojikon began to extend the cultivation of land towards Aksai. As a consequence, a group of elders had repeatedly appealed to the authorities of the Kyrgyz Soviet Socialist Republic (SSR) and equally to their Tajik neighbours to stop these activities. Yet, as my interlocutor suspected and other persons alleged, authorities of the Kyrgyz SSR had tacitly agreed to concede the respective piece of land with leaders from the Tajik SSR, and concluded a secret deal. Suspecting betrayal by their own authorities, as the elder explained, this was the moment when 'the Kyrgyz became very angry and prepared for war', perceived to be the only way to solve the problem by taking things into their own hands. Thus in this instance, it may not so much be the mere restriction of freedom and civil rights which gives rise to violence, but also the ultimate feeling of not being recognised and abandoned by the state.

This observation touches upon the norms and values that construe the concept of conflict transformation. This prescriptive approach is underpinned by a number of normative choices. While it defines the dysfunctionality of a social condition, it equally projects a remedied situation through social change. Dysfunctionality is identified by SDC, UNDP and Mercy Corps mainly in forms of individual attitudes, inter-group relationships and faulty institutions. In view of this, the aid agencies promote societal and political change, defined in categories such as 'modern', 'traditional', 'civil', 'participatory' and 'democratic'. My research shows that these categories are neither obvious nor

uncontested. Not only do they refer to vague, reified and idealised constructions, but the concept of conflict transformation is defined teleologically by reference to the supposed state of those who promote it. Thus, I argue that the frame of reference for the promoted social change becomes the supposed state of the societies that the donors are embedded in. Such an idea is explicitly expressed by Senghaas (2004) who suggests that 'the West', having undergone modernisation, can provide solution to those who are still in the process of it. Empirically, it also becomes manifest in the example of the CBOs whose social imaginary appears to pursue an idealised version of Western political organisation - not to be taken for an actual social practice. In this sense, conflict transformation entails a distinct ethnocentric bias. Such a bias becomes all the more problematic when coupled with ideas about moral progress towards a more peaceful, more civil and more harmonious society which underlie the aid agencies' approach and on which I will elaborate later.

In addition, the concept of conflict transformation also entails distinctly evolutionary narratives of how societies are expected to develop. Again, this is most clearly expressed by Senghaas (2004), who suggests that there is a road to modernity. CBOs stand in this sense for a future model, while past ones such as the elders merely serve instrumental or process-oriented purposes. The validity of this evolutionary idea has been contested by two insights. First, the inquiry into institutional histories of customary institutions in Central Asian societies discloses multiple 'modernities' and multiple 'traditions' that result from several layers of pre-Tsarist and Tsarist social engineering as well as Soviet modernisation schemes. Second, it demonstrates that institutions do not simply progressively evolve on a presumably pre-defined road to the future. Rather, they are consciously altered in their normative repertoire, their scope of validity and their social significance, at times appropriated by the state. Benda-Beckmann et al. (2003:297) note for traditionalism that, 'It usually results from present- and future-oriented strategies for (re)asserting collective identities and for dealing with competing political and economic claims'. 'Re-traditionalising', as it is being done by Central Asian states to create a national ideology, or 'modernising' institutions, as the aid agencies attempt with the substantive societal change through CBOs, are thus quintessentially political projects.

The promotion of civil society in the form of CBOs by the aid agencies entails a distinct vision of how the state and the individual should engage with each other. The model of the 'active citizen' which underlies CBOs, I suggest, is to confront the presumably determined subjects of formerly state socialist regimes with new forms of agency, making reference to a 'valorized "Western" Self' (Junghans 2001, p. 383) that is understood as self-authoring. The state, on the other hand, appears usually 'out there', and is thus referred to as being outside and 'above' local communities. This is exemplified by Lederach's (1997) idealised representation of the state's constitution, hierarchically structured. My empirical findings, however, strongly contests such a view. They show not only that the diffuse yet omnipresent nature of the state cannot be relegated to a level or a centre, but they similarly demonstrate that the contestation of what a state should be and how it should function takes place precisely at the level of the community. Equally, the boundary between those who personify the state and those who do not, appears blurred and cannot sharply be distinguished as suggested by SDC, UNDP and Mercy Corps.

These reflections lead to the issue of power. I have suggested that the aid agencies intended to evoke a form of 'power to' in the form of associational power. At the same time, the aid agencies and their projects themselves constitute a form of power that they exert. The analysis of the CBOs established by the aid agencies has shown, not surprisingly, that local societal arrangements and power relations (e.g., gender relationships) inscribe themselves into the organisation. In this sense, existing social relationships are not left 'at the boundary' of the new space that CBOs create, but continue to exert influence on how such organisations constitute themselves. Yet, the aid agencies also create new forms of power relations with CBOs. They shape specific public spaces where elections are held and decisions are supposed to be made. Such spaces may provide a forum for some, while excluding others. Furthermore, they give importance to particular types of knowledge and expertise held by segments of society. Finally, they shape specific forms of 'subjectivities' that

they construe for the inclusion into CBOs such as the elderly, the women and ethnic groups. In this sense, to some extent CBOs do rewrite the subjectivities of those who participate in the exercise of popular agency.

SDC, UNDP and Mercy Corps locate power to a high degree in human agency. Such agency is expected to develop without prior changes in structures and systems, even notwithstanding the stark forms of control and by no means conducive conditions. In this view, power thus resides with individual members of a community, and can increase with specific forms of sociability and the successful pursuit of individual and collective goals. Through this conceptualisation, responsibility for non-violent behaviour and relationships is being conceptually relegated to the conflict parties. Moreover, within the civilising and modernising ideas that underlie the approach, failure of the conflict parties to foreclose further violence is accordingly relegated to lacking moral progress towards peace. At least theoretically, such evaluation perpetuates the need for 'engaging those who are not as yet fully committed to peaceful change' (Mercy Corps 2003:17) into further peace-building, along the lines of Ferguson's (1990) influential statement of international aid as an 'anti-politics machine' which grinds on in a self-perpetuating manner.

However, it would be much too simple to conceive of the aid agencies' approach as the only nexus of power and knowledge that shapes the context. I have suggested (Bichsel 2009) that both the aid agencies and Central Asian states rewrite subjectivities of 'beneficiaries' and 'citizens' through projects of modernisation and re-traditionalisation. Furthermore, establishing knowledge about a conflict is a field of contestation for which the aid agencies may provide a site for expression; however, the processes that shape this contestation are far beyond the reach of the latter. In this sense, rather than constituting a regime of domination, I suggest that SDC, UNDP and Mercy Corps provide new space for political action and competition. The types of authority that become manifest in such competition and the forms of power that they constitute themselves from is often beyond the 'local'. Accordingly, enabling or constraining conditions and relations that crucially shape the room for manoeuvre for CBOs are not located in their constituencies. This observation questions the territorially defined and 'locally' understood nature of CBOs, and may also suggest that the idea of 'community' upon which aid agencies base their approach is of an essentialist and romanticised nature (see Delanty 2003). Finally, these reflections also question the idea of peace as a potential to be tapped locally, as the attempt of tapping 'positive local traditions and customs' (Mercy Corps 2003:19) suggests.

3.4 Conclusion

Harmony, the ultimate goal of SDC, UNDP and Mercy Corps, surfaces in many forms. It appears in the continuation of a 'success story' that describes '[…] the sincere well-wishes and goodwill that residents of Ravot brought to the opening [of the new drinking water system] to offer to their neighbors in Vorukh' (USAID 2003, no pagination). In this quotation, harmony is presumed in the absence of violence and the presence of friendly behaviour shown by the groups. This quotation locates harmony mainly in the behavioural realm and does not foreclose unequal relationships and a perception of an imposed compromise. Furthermore, a particular form of harmony also appeared in Khush'iar, when the Uzbekistani government violently quelled any form of possible unrest related to the conflict escalation by control and arms. The superimposed normalcy established resurfaces then as a representational fiction of harmony in the Kyrgyzstani and internationally oriented press which presented the conflict as resolved. Finally, harmony appears in the speech of the CBO representative that I met in the course of the escalation and who argued for moderation and tolerance after the outbreak of violence. In the face of other social forces and increased militarisation of the context, his elaborations on harmony appear not only forlorn, but become a source of suspicion. I thus conclude that the very idea of harmony does not embody the abstract 'good', but is itself intertwined with forms of power.

I suggest that SDC, Mercy Corps and UNDP failed to provide a solution to the conflicts at stake in the Ferghana Valley. In my view, this is a consequence of the three aid agencies' conceptualisation of these conflicts as emerging from adversarial relationships over scarce resources between ethnic communities and thus resolvable in the very same context. I propose four major points of critique to such an approach.

1. The perspective that conflict is endemic to the local context.

The first point of critique concerns the perspective that the sources of conflicts addressed are lodged in the relationship between communities differing in ethnic affiliation. The approach apprehends irrigation conflict as disrupted relations between two or several communities, and thus solvable in the very same context. My research demonstrates that such conflicts are not 'local' but embedded in wider political interests and power constellations. Issues at stake are thus often impervious to a 'local' solution.

2. The functional understanding of conflict.

The second point of critique addresses the functional understanding of conflict sources and parties that the approach exposes. Conflict is seen to emerge from 'grievances' over scarce resources. Such 'grievances' are expected to lead to violent conflict. Moreover, conflict parties are conceptualised as homogenous and uniform, shaped by essentialist solidarity that accounts for collective goals in a conflict. This research has pointed out the relativity of scarcity, has questioned that primarily unsatisfied needs lead to the adoption of violence and has finally deconstructed the monolithic representations of ethnic groups.

3. The assumption of homology between the conflict parties.

The third point of critique concerns the assumption of homology between conflict parties. The donors presume such homology not only between the conflict parties, but also between the CBOs and, more abstractly, for the enabling and constraining conditions which conflict mitigation meets in the respective countries. My work has pointed out that upstream-downstream configurations in irrigation systems are power relations. Furthermore, it has shown that conflict and its mitigation do not take place outside power constellations.

4. The normative nature of proposed social change.

The fourth point of critique addresses the normative nature of the social change brought forward by donors. It maintains that both by portraying irrigation conflicts and by proposing their 'transformation', the approach studied exposes normative accounts of evolution and moral progress. The study has brought to light some of these assumptions and suggests that apart from their ethnocentric bias, such prescriptions also lead to forms of depoliticisation and disempowerment.

Expressed in admittedly simplified terms, more water does not equal 'better' people, as is presumed. Promotion of the aid agencies' approach is based on the assumption that conditions of equal power exist between the two parties. It further assumes that negotiation and mediation take place in a vacuum, thus isolated from the local political and economic context, let alone the wider political contingencies, power constellations, and elite interests. This may be a consequence of underlying assumptions that causes of conflict are to be found in the relationship between communities, and that negotiation and mediation take place between equal partners and outside power relations. Nader notes that 'the rhetoric of harmony law models is attractive. But the idea that in a conciliatory model people do not fight but rather harmoniously agree about a common solution is fiction. So also is the belief that such a harmony model exists in "primitive" and "idyllic" societies. Once again we need to understand the real dynamic of power that is at play'. (Nader 2001: 25).

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4 Risks and Conflict Management Options of Water Property Rights Reforms. Empirical Evidences from Shared Systems for Irrigation Water in Ethiopia

Moges Shiferaw[9]

4.1 Introduction

There are two approaches on how governments can influence property rights over common goods: the new institutional economic approach and the political science approach. The political science approach to a reform is a widely implemented reform approach in developing countries, although it has been criticized for ignoring the conflict dimension of a reform as well as for its rigidity (see for example Moorehead 1994; Scoones 1994a). On the contrary, the new institutional economic approach is conflict inclusive and flexible, but was less practice-oriented until recently (Platteau, 1995). After years of overlooking the property rights centered reform approach in managing common problems, countries are starting to realize that property is a central element of economic development and social prosperity. In the course of the last decade developing countries have tried to implement policies and legislations that recognize the importance of common property systems for the management of local common goods such as forests, pastures and irrigation systems. The growing scarcity of water resources and increasing competitions among users have also pressured governments to develop a less politically sensitive property rights system to water management. Despite the efforts at local level, institutional shortcomings are still highly pronounced.

However, the potential risks of a property reform, technical difficulties and the inability to establish a uniform system for all types of common goods, as well as unintended or ineffective reform outcomes have remained major obstacles for initiating substantial property rights reform programs. More importantly, the lack of a flexible framework that can be used to effectively explain most of the property rights arrangements found in the real world and the magnitude of the reforms required to respond to changes in various factors have led to wrong policy choices and excessive or insufficient interventions. This adds a new dimension to the task of promoting a property rights reform, i.e. the identification of risk-free and workable policy prescriptions for a property rights reform. This paper focuses on the search for such alternative policy prescriptions and frameworks used to explain real-life property rights. The framework is also used to evaluate the efficiency of shared irrigation systems in Ethiopia.

We argue that the missing link in current reform programs in the field of water property rights is the use of policy prescriptions that are not suitable to the current reality. The current policy prescriptions for water rights reforms that focus on "getting the collective incentives rights" are less desirable for a society's common resources, at least in the context of a developing economy where water is considered both an economic and a social resource. Although "getting the collective incentive right" policy prescriptions make a user society responsible and the work of its institutions and organizations make significant contributions in water economies, the prescriptions overlook the human dependency on water and the dynamic nature of water scarcity as well as the conflicts that it generates. A policy prescription that focuses on "Getting the property relations right" seems to be more responsive to the pressing needs for water rights reforms. It also helps to delineate the areas of government interventions, which is one of the major challenges in the current reform approach. The basic hypothesis of the above policy prescription is that if we manage to get the relationship among water sharing parties right, nearly all the problems will be resolved by the parties exercising those rights. The role of the government should therefore be limited to getting the initial relations correct and balanced.

The next section offers an overview of alternative policy prescriptions for a property rights reform. It presents the importance of the approach of bundles of property rights, and subsequently describes general principles related to a socially optimal property rights system. A framework used to measure the efficiency of a property rights system is also presented. In the second section, we present the data used to analyze the social optimality of property rights in shared irrigation systems in Ethiopia. In section three, we present the outcomes of the analysis and its policy implications.

4.2 Social Property Rights Reform Framework

In a social property rights system approach resources are conceptualized in terms of bundles of rights over valuable attributes of a resource. In literature, equating a resource with bundles of rights is well documented (for example Brazel 1982, 1997; Eggertssonn 1990; Ellickson 1993). What a society shares is not a resources *per se* but bundles of rights. Thus, in the context of socially shared water resources, the concern is the social distribution of bundles of rights. This social structure of rights determines a society's behavior, action and responses to any water related issue. A social property rights reform is therefore the appropriation of all essential bundles of rights to a society's water use. For this to happen, a prior determination of essential bundles of rights that need to be allocated, as well as a decision about who should own particular property rights, an institutionalization and an initial allocation of rights are important. This conceptual framework of equating a resource with bundles of rights leads to two major shifts in thinking: a shift from a "resource first"- approach to a user-society perspective; and a shift from an objective indicator to a structural perspective. The latter implies that a society's structure of property over resources is the main factor explaining performance variabilities across societies and time. Therefore, scarcity - and who suffers from it - is ultimately a socially defined structure of rights and entailments rather than a scarcity of a resource as a physical entity. It is the structure of a society's rights that determines the society's response to any situation, such as conflict.

Let's imagine a society with n members that share a clearly demarcated and well defined geographic territory containing a water system (e.g. a basin, a watershed, or an irrigation system) which has a potential to generate X units of water flow per second. The territory defines the boundary of the society's property in order to make decisions about water issues. Given the physical boundaries of a resource, there are two important questions that one should ask in order to understand the structure of shared property rights in a society. The first deals with the existing property rights regarding the use of the resource. Below we have for instance identified seven essential bundles of property rights relating to the use and management of common resources. Schlager and Ostrom (1992) identified five bundles of rights relevant for the use of common resources. Assuming that rights are exogenously provided by the government, a community of resource users may be given one or all bundles of rights. A particular bundle of rights in the community may not exist in another community of resource users. The difference in the number of the total bundles of rights explains the quantity of property rights of the community as a whole.

The second question relates to the fact that concentration and de-concentration of bundles of rights may vary. The most important distinction can perhaps be made between *private property*, where all bundles are concentrated in the hands of a single member of the society and *collective property*, where all bundles of rights are jointly held by all members. It is needless to say that a classification of social systems relating to resources and based on the degree of centralization of the control is closely related to the degree of concentration of bundles of rights in the hands of a single individual. A property is said to be freely accessible if all bundles of rights are freely exercised by all members of the society - i.e. if there are no internal exclusion rights. A property right is said to be communal if all bundles of rights are exercised jointly by all members of the society and competitions about exercising shared rights are resolved through majority voting. Finally, a property right is said to be social if all bundles of rights are exercised collectively in the form of public choice. In this case individuals not only have the right to vote, but the majority has the obligation to respect individual preferences or choices in the collective decision-making.

4.2.1. Measuring the Social Optimality of a Property Rights System: Theoretical Framework

The social optimality of a property rights system can be measured in terms of numbers of bundles of rights and associated quality parameters. Unlike the two conventional frameworks of a property rights system (all bundles of rights held by a private individual or all bundles of rights held by the community as a whole), which tend to focus on one side of the problem of rights inefficiency, we have a feeling that the best way of measuring the efficiency of a property rights system in our framework can be achieved by combining the two components of common-pool resources (CPRs): property rights to a resource system and property rights to a resource flow. The central idea is that the two components of CPRs are interrelated and hence that the property rights systems are complementary and must be considered in an integrated manner if the objective is to establish and maintain an efficient property rights system that leads to a Pareto efficiency outcome through voluntary bargaining at different levels. We are optimistic that it is possible to solve both components of the problem by establishing and maintaining an efficient property rights system for CPRs that comprises both (appropriately aggregated) private resource flow rights and communal resource system rights. In order to create a more systematic framework for socially optimal property rights, it will be useful to conceptualize the total CPR's rights system in terms of two sub-systems: a resource system and a system for resource flow rights.

Systems for Resource Flow Use Rights

Recognizing the shared nature of property rights, Alchian (1965); Demsetz and Alchian (1972) and Eggertsson (1990) identified the three bundles of property rights that are most relevant for shared asset ownership: the right to *consume*, the right to *obtain income* from the resource, and the right to *alienate* (sell) either of the other use rights. This classification dates back to Roman law (Meinzen-Dick, 2000). According to Meinzen-Dick Roman law distinguished between four bundles of rights in a property rights system: the right to use the resource *(usus* right*)*; the right to derive income from the resource *(usufructus* right); the right to change the resource *(abusus* right*)*; and right to transfer the resource to others *(alienation* right*)*.

In order to build our framework, we will use these four bundles of property rights as essential elements of resource flow rights that must be considered when judging the optimal structure of private resource flow ownership. Eggertsson (1990) defines these four bundles of property rights as follows:

Use right (UR) - the right to use an asset - defines the potential uses of an asset that are legitimate for an individual in order to consume a specific quantity of a resource in a given time, place and type of use.

Change Right (CR) - is the right to change the time, type of use and place of resource, including the right to transform the physical structure of the resource.

Benefit Right (BR) - is the right to get income by temporarily transferring resource use rights. This allows individual co-owners to transfer the resource to a third party temporarily while still maintaining the ownership right; and

Sell Right (SR) - refers to the right to permanently transfer ownership rights over an asset to a third party.

Of course, the delineation of private rights over a resource flow is not costless; the optimal structure of a property rights system that contains economically relevant bundles of property rights will deviate from the ideal to a certain extent. Scholars therefore include other parameters to judge the efficiency of a particular private property rights system. Particularly, following the work of property

rights theory (Demsetz, 1967, 1969, 1988) and transaction cost theory (Williamson, 1975,1985, 1996), the quality of property right is considered a legitimate parameter to judge the efficiency of a particular property rights system (Bromley, 1991). The costless ideal quality of a private property right would be to maintain all economically relevant bundles of rights to the perfection. In the world of positive transaction costs, the same content of rights might result in different qualities of rights and have different economic implications and might therefore be subjected to economic analysis.

Resource System Rights (RSR)

It is important to distinguish between two types of ownership within the communal resource system rights. The physical boundaries of the group's ownership are a private property right for the group. It can be considered as the maximum boundaries of ownership that determine the action and behavior of individual co-owners. It can be defined as the relationship between the group and the rest of the society with regards to the resource system under consideration. Thus, by considering how the attenuation of these basic bundles of regulative rights affect the outcome of the collective decisions, we can identify three classes of consolidated proprietorship to a common pool resource system in which all owners hold or do not hold all three bundles of rights (e.g. management right owners, exclusion right owners and alienation right owners). These differ with regards to the degree of regulative rights. For an empirical analysis - instead of focusing on one type of consolidated decision making rights over a CPR system - it is therefore more useful to define the three types of consolidated communal proprietorship as alternatives that need to be compared to the ideal consolidation ownership.

Beside the external relationship, the opportunistic behavior of co-owners needs to be controlled. We argue that if opportunistic behavior is to be controlled within the group, all co-owners must have both the right to control the decision of other co-owners and sufficient incentives not to depart from the optimal decision. To this end, all co-owners within a particular communal proprietorship must possess all essential bundles of regulative rights (management, exclusion and alienation) that are susceptible to opportunism. These bundles of regulative rights held by co-owners define the ownership boundaries of co-owners within the group, if the objective is to study how bargaining among co-owners results in a Pareto-optimal decision. By considering how the distribution and the attenuation of these basic regulative rights affect the bargaining behavior of co-owners within the group, it becomes possible to secure new insights into the behavior of various types of co-ownership to a resource system. In this view, we can define three classes of co-owners where all co-owners may hold or not hold the three essential bundles of clearly delimited and equal regulative rights (e.g. claimant co-owners, appropriator co-owner and co-owners).

Management Rights Owners Proprietorship refers to co-owners operating under management group rights. Typical examples of this type of rights arrangement can be found in self-organized communal proprietorships. The ownership of decision-making rights over the management of the resource system is vested in a group. Individual co-owners have both the right to participate and the obligation to contribute to the maintenance and operation of the resource system. Under ideal conditions, in this communal proprietorship system, all co-owners are granted equal rights to decide on the size of resource abstraction (resource stock exploitation), to transform the resource system by making improvements or otherwise altering the nature of the resource system and to determine how associated economic and non-economic benefits or costs are to be distributed within the property system. According to Ostrom's property rights classification (2000), these co-owners can be labeled as a *claimant co-owners* since they are granted a decision-making power over a resource system, with regards to the construction and maintenance of facilities and have the authority to devise limits on the rate of resource stock extraction. In this system, both co-owners and the group do not have the right to determine who may access the resource system and harvest it.

This type of communal proprietorship may be important for resource systems which are susceptible to appropriation externality (e.g. fish stock, ground water), non-renewable resources (e.g. oil, mineral stock) and common pool resource systems which require periodic maintenance and investment (e.g. irrigation systems). For those resource systems, management rights are of critical importance to sustain the flow of resource units or benefits and hence to bargain over collective decisions regarding the management of the resource system.

Proprietorship of Exclusion Rights Owners refers to the consolidation of decision-making over exclusion. It grants collective exclusion rights to the group in addition to collective management rights. The collective exclusion rights provide the group with the security to keep the benefits from the collective investment. Co-owners operating in this system can refer to those *proprietor co-owners,* who possess equal rights to determine who will have what access or withdrawal rights from the resource system, on what terms decision-making rights over the resource system will be granted, and how these rights may be transferred to third parties. This determines to what extent non-members or non-right holders can be excluded from the use of and decisions about a CPR. These exclusion rights of co-owners provide incentives and self-enforce multilateral bargaining over "the rules of exclusion" and sanction mechanism. This classification has been widely used in the study of CPRs in order to explain the relationship between individual rights and the efficiency of bargaining over rules of exclusion and sanction mechanisms.

Proprietorship of Alienation Rights Owners: in addition to management and exclusion rights, the proprietorship of alienation right owners grants the group the right to transfer management rights over the resource system (e.g. the right to select who provides maintenance of the system and who operates within it) as well as exclusion rights (e.g. the right to select who provides exclusion) to third parties. This allows the group to select efficient service providers (if they are outside of the group) and to control the quality and quantity of services offered by such service providing institutions. An example of this is the modern cooperative system. This type of communal proprietorship is important for a common pool resource which requires high-tech maintenance and equipped power exclusion (e.g. oil or irrigation systems). This in turn determines the negotiation power of the group as a decision-making unit about the market allocation of resources. A lack of alienation rights restricts the group insofar as it does not get the possibility to transfer the management and exclusion of the resource system outside of the group.

Under ideal conditions, co-owners operating under communal proprietorship of alienation rights have the right to transfer (temporarily or permanently) the decision-making rights over management and exclusion to group members or bequest them to their family. The right to sell or lease either management or exclusion rights allows co-owners to decide on the rule of rights transfer within or outside of the group.

The threefold classification of communal proprietorship is based on the content of regulative rights and rests on two assumptions: *(a)* an equitable distribution of co-owners' rights within the property boundaries of the group, and *(b)* a zero-cost consolidated decision-making. If the transaction cost is positive, the distribution and the quality of the essential bundles of regulative rights define the ownership boundaries of the group of owners of the resource system. Moreover, it is precisely the analysis of changes in the content, distribution and quality of these regulative rights that requires detailed investigation, if the objective is to search for optimal boundaries of communal proprietorship. This requires developing a flexible framework that captures both the variability in the distribution of co-owners' rights and the cost of decision-making.

Quality of a Property Rights System

To examine the economics of the quality of rights, economists have tried to find out what quality parameters govern the structure of an efficient property right and developed a set of quality parameters for property rights which would ensure optimality in terms of ownership under a

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perfectly competitive market. In this line, Posner (1977) suggests *universality*, *exclusivity* and *transferability* as three quality parameters to judge the efficiency of a private property rights system for the market to operate. Randall (1987) proposes four parameters for efficient allocation of resources: private property rights ought to be *complete*, *exclusive*, *transferable* and *enforceable*. Tietenberg (1992) identifies four parameters as pre-conditions. They are similar to Randall's suggestion, but contain more clarifications. In property rights literature, these quality parameters are referred to as 'characteristics of property rights'.

Tietenberg (1992: 45-6) defines the four quality parameters as follows:

- *Universality* - all resources are privately owned, and all entitlements are completely specified;
- *Exclusivity* - all benefits and costs resulting from the ownership and usage of the resource should accrue to the owner, and solely to the owner, either directly or indirectly or by sale to a third party;
- *Transferability* - all property rights should be transferable from one owner to another in a voluntary exchange; and
- *Enforceability* - others should secure a property right from involuntary seizure or encroachment. This parameter is used to measure the security of a right.

Under ideal conditions (presuming no transaction costs), an optimal structure for private property rights which is compatible to a resource flow must have four completely specified, exclusive, transferable and enforceable bundles of privately owned property rights. In the case of positive transaction costs however, a comprehensive framework should take this fact into account. Different resources might need a different degree of security, specification, exclusion and transferability, depending on the characteristics of a resource and its objective function. Each quality variable has different economic implications similar to bundles of use rights. Hence, like any other commodity, the value of any exchanged bundle of rights depends, *ceteris paribus*, on the quality of the bundle of rights that is conveyed in a particular property rights system.

As we can see from Figure 1.1, a property rights system for the management of a common pool resource is said to be complete if it contains 4 bundles of use rights and 3 bundles of regulative rights (decision- making rights). Under ideal conditions (no transaction costs), the optimal boundary of a quasi-private property rights system for CPRs comprises two complete property rights sub-systems, i.e. a property rights system for the resource flow (henceforth, *the use rights system or URS)* and a property rights system for the resource system (henceforth, *the regulative rights system or RRS)*.

Fig. 1.1: Combination Framework for Resource Flow Rights and Resource System Rights
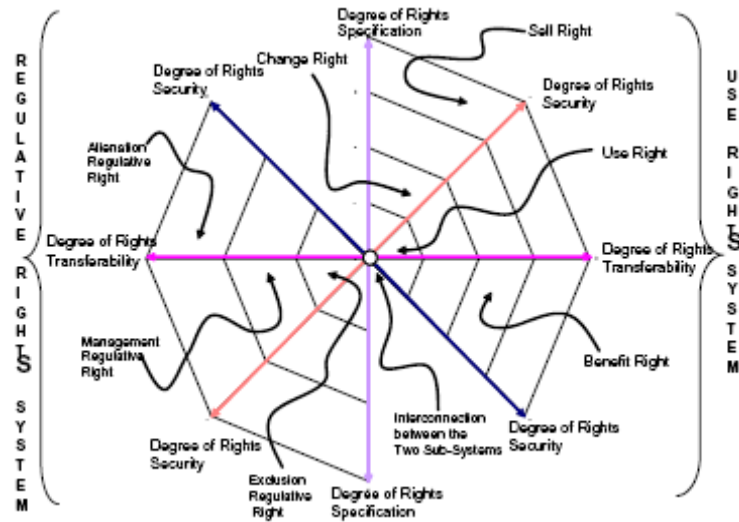
A shared property rights system for CPRs which does not contain one of the above mentioned bundles of rights is considered to be an inefficient property rights system for the management of all common problems. From the framework, one can argue that the optimal boundaries of CPR ownership are entirely dependant on: *i)* the number of bundles of use rights over a resource flow; *ii)* the number of bundles of regulative rights over a resource system; *iii)* the quality of the bundles of use and regulative rights; and *iv)* the aggregation of the systems for use rights and regulative rights in the total system. The optimal structure of a CPR rights system is more complex than resource flow rights and resource system rights in the sense that it considers the interrelation between the two rights systems. Our emphasis below is on the fourth point *(iv),* i.e. on the incentives associated with different types of combinations of the two rights systems under ideal conditions.

By considering how the attenuation of the private property rights over a resource flow and communal property rights over basic bundles of resource flow use rights and resource system rights affects the action and the behavior of CPR right owners, it becomes possible to examine the economic incentives by analyzing various types of combinations between private and communal property rights systems. Based on the above framework, we can define 12 alternative types of combinations of resource flow and resource system rights. All individual co-owners in the property rights system may hold well-defined and enforced property rights that include (or do not include) all four bundles of equal use rights over a resource flow and all the three bundles of co-equal regulative rights over a resource system (Table 1.1). The table shows a matrix of alternative combinations of the two rights systems.

Based on the above framework, we can define 12 alternative types of combinations of resource flow and resource system rights. All individual co-owners in the property rights system may hold well-defined and enforced property rights that include (or do not include) all four bundles of equal use rights over a resource flow and all the three bundles of co-equal regulative rights over a resource system (Table 1.1). The table shows a matrix of alternative combinations of the two rights systems.

Table 1.1: Matrix of Alternative Combinations of Bundles of Resource Flow Rights and Resource System Rights

Resource System Rights (Decision-Making Rights)	Resource flow rights (type of tenure system)			
	Use Rights (U)	Change Rights (C)	Benefit Rights (B)	Sell Rights (S)
Management (M)	MU	MC	MB	MS
Exclusion (E)	EU	EC	EB	ES
Alienation (A)	AU	AC	AB	AC

The above table indicates 12 possible rights systems for resource flows (tenure systems) and for resource systems. The management-use type *(MU)* represents a property rights system that contains the minimum number of attenuated resource flow and resource system rights. The alienation-sell type *(AC)* is a property rights system that contains the maximum number of attenuated bundles of resource flow and resource system rights. This is an ideal case where all individuals hold seven completely specified, exclusive, transferable and enforceable bundles of rights. The economic implication of each rights system is similar to the explanation for each bundle of rights in the previous section. The combination of the two rights systems only improves the quality of the existing bundles of rights and hence, presuming no transaction costs, this variable is not relevant for an economic analysis.

From the above, we argue that theoretically, there is only one set of socially optimal property rights system for shared rights that foster democratic use and management of shared water resources. When the society's property rights structure is at the point of the social optimum, there is an equitable relation and an efficient structure of interactions; individuals are in a state of cooperative behavior. Under these conditions, the use of a CPR is optimized and a water sharing society is in its most efficient, equitable and stable mode. Alternatively, a socially optimal property rights structure to water resources leads to relations among water users generating the most equitable wealth distribution from shared resources and to positive outcomes of water-induced conflicts. Any deviation from the socially optimal rights structure is considered to be socially sub-optimal. Because of the shared nature of rights, the social optimality of shared property systems is considered Pareto sub-optimal: there is an alternative restructuring of the society's rights that would make all its members better off without making any worse-off.

4.2.2. Actual Measurements for Empirical Analyses

For actual measurements, the social optimality of a particular rights arrangement is dependant on the structure of individual members' ownership rights within the system, since the total rights are nothing but a conglomeration of different individual rights. Thus, the social optimality of a particular property rights system is measured in terms of the sum of individual owners' concentration of rights. The concentrations of total rights that derive from outcomes in models based on fully defined social property rights systems are sub-optimal. We measure an individual co-owner's concentration of rights on the basis of his/her perception of the number of bundles of rights and associated quality parameters he/she holds within the society.

Accordingly, we use the following formula to calculate the different rights efficiency indices of co-owners that capture both bundles of rights and associated quality parameters. The ratio of the expected value of a property rights system and the actual current value of a property rights system is given by

$$EPRi_{ts} = \frac{\sum_{i=1}^{n} BR_{it} \sum QP_{it}}{\sum_{i=1}^{n} BR_{is} \sum QP_{is}} \quad (1.2)$$

where $EPRi_{ts}$ is a measure of the efficiency of a property rights system for the ith farm, BR_{it} and QP_{it} represent the basket of bundles of rights (use rights or regulative rights) and associated quality parameters held by the ith co-owner at the time of interview. BR_{is} and QP_{is} stand for the bundles of rights and associated quality parameters that a co-owner is expected to be granted by the system.

The value $\sum_{i=1}^{n} BR_{it} \sum_{i=1}^{4} QP_{it}$, for which the index is calculated, is referred to as the "current value

of the rights system". Similarly, the value of $\sum_{i=1}^{n} BR_{is} \sum_{i=1}^{4} QP_{is}$ is the reference value of a rights

system used as "the best rights system" according to the expectations of the co-owners. We can use the same formula to disaggregate the total efficiency indices into components, i.e. without a loss of generality; s and t may then refer to the expected and actual values of use rights or regulative rights of the total rights system.

Thus, considering individual co-owners' rights as units aggregating or disaggregating a property rights system is very valuable in order to understand the structure of the total rights system and its elements. One of the specificities of the framework is that it provides an individual perspective of the processes through which social interaction is influenced, where the vested interests of co-owners and potential distributional conflicts are taken into account. This framework helps to explain why cooperation among parties in conflict is impeded, undemocratic use of social resources and inefficient decision-making processes persist and an inefficient property system is tolerated.

Below, we use this framework to measure the social optimality and the quality of the prevailing rights system for shared irrigation water in Ethiopia. No water rights reform takes place on a blank slate: in every case, some form of claims or rights over water have already been established through traditional procedures, sponsored by private actors, NGOs or the government. Therefore, it is important to assess the social optimality of the existing property rights system before attempting to enact a new system. This gives us exact answers about the direction and magnitude of a reform required to achieve the desired outcome with minimum costs and less negative consequences in terms of distribution.

4.3 Data Sources, Data Collection Methods and Sampling

The diversity of institutional arrangements for shared irrigation water across the different regional states of Ethiopia is striking. They are different in hydrological, institutional and organizational terms as well as in terms of content, quantity and distribution of bundles of rights. Given the vastness of the country and the diversity of institutions linked to irrigation water rights across regional states, it is however very difficult, at least in this research context, to cover all regimes of property rights over irrigation water in the country.

In order to improve the generalizability of the findings, we have collected data from three districts of the Amhara state in Ethiopia: the Bure district in the West Gojam zone, the Banja district in the Awi

zone and the Fogerra district in the South Gonder zone (Map 2.1). The three districts were selected on the basis of pre-set criteria, which include the existence of a diversity of institutional arrangements for irrigation water, an experience of irrigation and a presence of irrigated agricultural production in the region. The data used in this paper was obtained from the author's surveys in the three districts conducted in 2006 and aiming to identify the social structure of shared irrigation property rights under different institutional arrangements for water use and its consequential performance impacts. Twelve shared irrigation systems were carefully selected from the three districts, based on their varying structure of social property rights regarding the use and management of irrigation systems. The water source inventory carried out in 2006 by the regional state provided a sampling framework for classifying irrigation systems based on their institutional, organizational, technological and hydrological differences.

Map 2.1
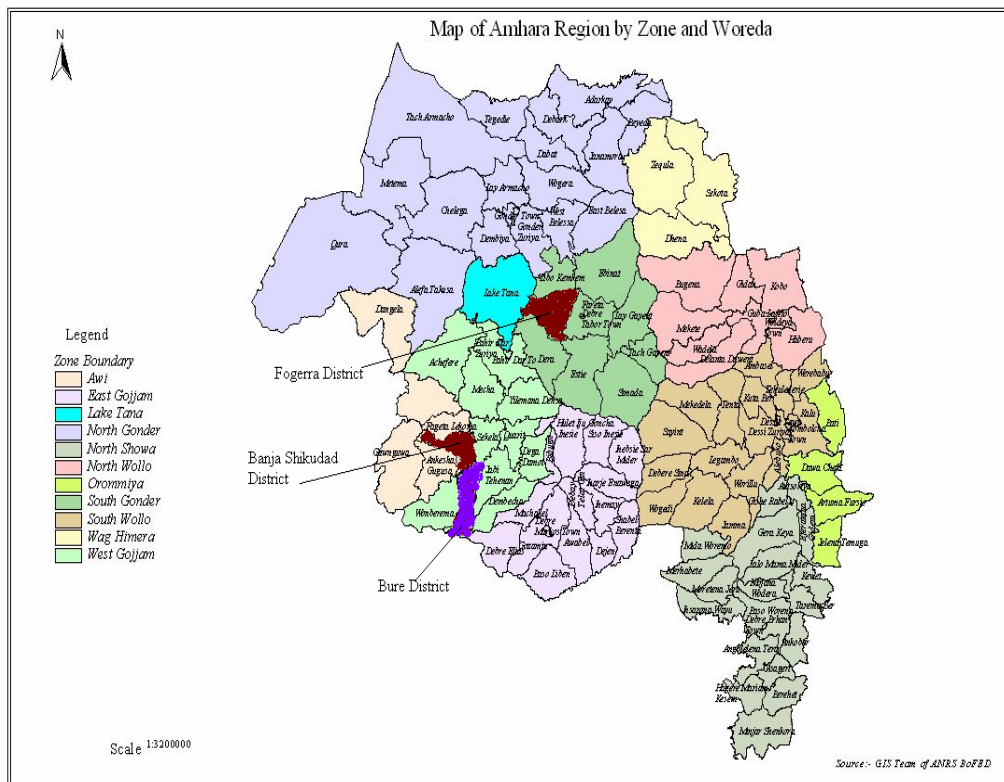
We have collected data both at the societal and at the individual levels. To collect data at the irrigation level or societal level, the study primarily relied on community workshops, group discussions, reviews of bylaws and key informants. To this aim, we organized 12 community workshops (with 25-32 participants) and 24 group discussions (with 8-12 participants), reviewed 6 written bylaws and conducted 60 interviews with key informants in order to collect data about internal and external factors influencing the choice of certain institutional arrangements and to identify the elements of property rights found in all institutional arrangements for irrigation water rights; these comprise bundles of rights, enforcement mechanisms, origins of rights, practices for the initial allocation of rights and management. The data obtained from the groups was used to explore and compare social interaction and variability in cooperation, vulnerability, risk and conflict associated with the irrigation water structure, so as to understand under what conditions different institutions co-exist and to examine what factors determine the shape of an institutional arrangement.

To collect data at the level of individual farms, the study primarily relied on experimental (actual recorded data to collect inputs and outputs) and structured interviews with individual farmers. Their aim was to collect individual farmers' perceptions about the concentration of use rights and regulative rights they held in the institutional arrangements under which they were operating. Due to the lack of data about the population of the users, we compiled a new list of users across the 12 selected shared irrigation systems. To capture the asymmetry between users along the same irrigation system, we divided the total population of each scheme into three sub-samples (upper, middle and end users group). To randomly select a sample size of 30 individuals from each irrigation system, we first divided the total population (N) into three, N=*3n*, where *n* is the total population of the sub-samples in each position; we then randomly selected 10 irrigators from each sub-sample population *n*. In this way, a total of 360 onion-cultivating farmers (30 from each irrigation system) were randomly selected. This data was used to understand the structure and distribution of actual rights of co-owners and to value the perception of users about the initial contract. Individual level data was further used to make a comparative analysis of the different institutional arrangements and of the resulting performance effects.

4.4 Social Optimality of Irrigation Water Rights in the Study Area

We used a normative economics approach to answer the following questions:

- Are the existing rights systems for shared irrigation water efficient?
- If not, how serious is the inefficiency?
- Are the different elements of property rights structured optimally?

These empirical questions were used to evaluate the overall social optimality of existing shared rights systems in the study areas. For this analysis, we used the framework developed in section 2.

To examine the efficiency of property rights of individual rights holders in the examined communal arrangements for irrigation water rights, we collected data from five different types of communal arrangements from 12 irrigation systems. Each of the 360 co-owners was asked about his/her perception of the rights he/she held with regards to the number of bundles of rights and associated quality parameters at the period of the survey and compared to his/her expectations about the best possible rights arrangement. Individual co-owners were asked a direct question about the number of bundles of use and regulative rights they perceived had been granted to them by the system. They were further asked to evaluate the quality of each bundle of rights they had acquired in the system, on the basis of four quality parameters expressed on a scale from 1 to 5: a score of 1 to 5 was assigned to the quality of a right (5 for excellent, 4 for very good, 3 for good, 2 for poor and 1 for no bundle of rights). We then used the formula developed in equation (1.2) to aggregate the quality and quantity vectors of rights values into a single unit.

In this way, we established a property rights efficiency index to measure the deviation from the ideal rights arrangements, i.e. the arrangement considered best by the co-owners themselves. If the total property rights concentration index value equates to 1, this means that all individual co-owners have absolute quasi-private property rights. The central idea is that an equilibrium-efficient system of quasi-private property rights is reached when the process of re-adjustment is completed and when no further restructuring or re-allocation of rights make some collectives better off without making others worse off.

The computed average, maximum, minimum and standard deviations of the total concentration of rights for the whole sample are presented in Table 3.1. As indicated in the table, the mean value of total rights concentrations of co-owners is 0.425 for the total sample. This figure implies that the mean rights concentration for the whole sample is by nearly 58% lower than the ideal rights concen-

tration. From this, one can safely conclude that a reorganization of rights would substantially improve the performance of irrigation management in Ethiopia, and particularly in the study area. The gap between the ideal and actual measures and the 58% inefficiency in the case study area would imply that a massive reform of irrigation water rights is required at the communal level so as to substantially improve the performance of community-managed irrigation systems in the country.

The computed average, maximum, minimum and standard deviations of the composition of the aggregated rights system in terms of concentration indices for use and regulative rights are presented in Table 3.1. As the table clearly shows, the mean values for the concentration of use rights, regulative rights and total rights of co-owners were 0.525, 0.375 and 0.425, respectively. These figures imply that the mean rights concentrations of use rights, regulative rights and total rights for the whole sample are lower by nearly 50%, 60% and 58% respectively than the ideal concentrations. The table also shows that the mean concentration of regulative rights for the total sample (0.375) is lower than the mean concentration for use rights (0.525), indicating that the problem of regulative rights is more severe than the problem of use rights in the study area.

Table 3.1: Concentration Indices for Use rights, Regulative Rights and Rights Quality with Respect to the Total Sample of Farms, the RRO farms and the URO Farms

	Mean	Max	Min	St.D	# of Farms
Total Sample					360
Use Rights System Con.	0.525	0.725	0.050	0.123	
Regulative Rights System Con.	0.375	0.800	0.200	0.233	
Total Rights System Con.	0.425	0.757	0.014	0.165	
Overall Quality Index	0.55	0.90	0.20	0.234	
RRO Farms					185
Use Rights Con.	0.725	0.825	0.250	0.112	
Regulative Rights Con.	0.675	0.800	0.200	0.198	
Total Rights Con.	0.634	0.814	0.289	0.155	
Overall Quality Index	0.75	0.90	0.30	0.211	
URO Farms					175
Use Rights Con.	0.475	0.675	0.050	0.143	
Regulative Rights Con.	-	-	-		
Total Rights Con.	0.45	0.675	0.050	0.143	
Overall Quality Index	0.35	0.75	0.20	0.243	

The mean values of the four parameters for quality measurement with respect to each bundle of use and regulative rights are presented below in radar graph 3.1. The mean value of the quality parameters indicates that the overall quality of sell rights is the poorest, followed by benefit rights,

change rights and use rights in the total sample. Similarly, the overall mean value of alienation rights is the poorest, followed by exclusion rights and management rights. The radar graph further indicates that the quality of the total rights system is decreasing as we move from use to sell rights in the use rights system and from management to alienation rights in the regulative rights system. The dual implication of this observation is the following: the higher the number of bundles of use rights and regulative rights, the better will be the overall quality of a use rights system or a regulative rights system, and hence, the higher will be the overall quality of the total rights system. In other words, it indicates that the quality and quantity elements of rights are directly proportional.

Graph 3.1: Quality Demission of the Total Sample with Respect to the Four Quality Parameters
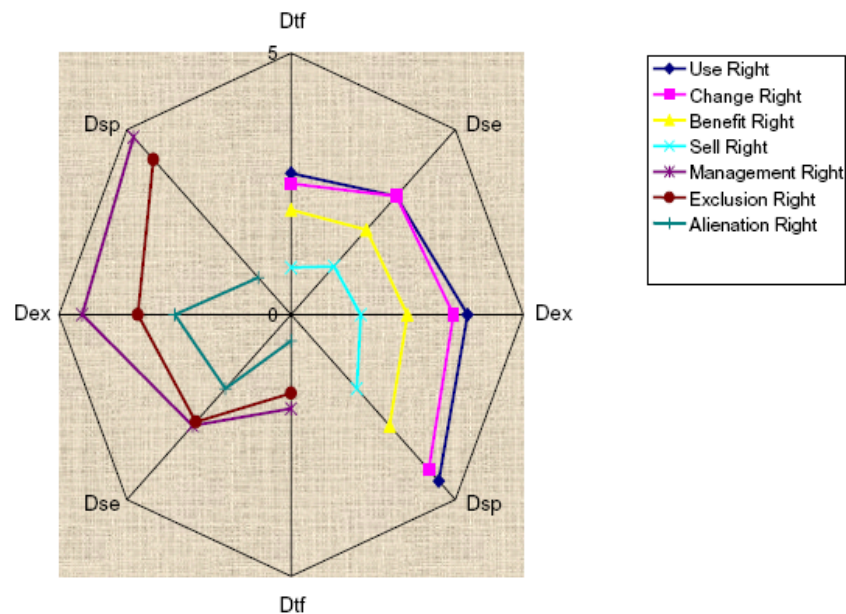
The whole exercise above confirms that the current supply of irrigation water rights through communal proprietorship in the region is highly inefficient. The value of the total rights concentration index indicates that the country should undertake a massive property rights reform, if the objective is to bring about substantial changes in the management of the irrigation systems. According to these results, one could argue that the growth of irrigated agriculture in the country is blocked by the weakness of institutional arrangements at a communal level, which fail to provide co-owners with effective and efficient rights that allow for decentralized decision-making.

The efficiency values above enables us to use different ways of disaggregating a total property rights system according to the structure of co-owners' rights in the system. In the following step, using these efficiency indices, we detect missing property elements and structural elements of rights in the studied water rights arrangements and propose general policy recommendations aimed at improving the efficiency of shared rights arrangements. The two key areas linked with the inefficiency of shared rights arrangements are property elements and structural elements of rights. Below, we discuss each of them separately.

4.4.1. Property Elements of Water Rights

Although we primarily discuss community-managed arrangements for irrigation water rights as a single type of property rights regime, there is substantial variability between individual's co-owners' rights, both in terms of numbers of bundles of rights and in terms of associated quality parameters *(property rights elements)*. Based on the review of the 12 above mentioned written bylaws dealing with community managed irrigation systems, as well as on discussions about verbal bylaws with key

informants, community workshops and group discussions, we have identified five distinct types of institutional arrangements for irrigation water rights in the study area. These are the following: unregulated communal (URC), privately regulated communal (PRC), state-regulated communal (SRC), group- regulated communal (GRC) and corporation-regulated communal (CRC) arrangements. They differ in terms of the number of bundles of rights and in terms of associated quality parameters. The number of bundles of use rights and regulative rights of the different property rights arrangements are presented in Table 3.2. The table shows us that, as we move from unregulated communal to corporation-regulated communal, the content of property rights are improving in two ways: *i)* the number of bundles of use rights moves from "no exclusive use rights" to "sell rights"; and *ii)* the number of bundles of regulative rights moves from "no regulative rights" to "alienation rights".

Out of the five types of common arrangements for irrigation water rights in the region, three are community-driven institutional arrangements: unregulated communal, group regulated-communal and corporation-regulated communal arrangements. They are different in terms of numbers of bundles of use and regulative rights, as well as in terms of equity of use and regulative rights distribution. Unregulated communal arrangements are an extreme case where there are no use and regulative rights. Corporation-regulated communal arrangements are the other extreme case, where all bundles of use and regulative rights are granted. Group-regulated communal lies between corporate-communal and unregulated communal. It consists of two bundles of regulative rights (management and exclusion rights) and three bundles of use rights (use, change and benefit rights). As compared to state-driven and privately driven institutional arrangements, users of community-driven systems were fairly satisfied by the establishment of different types of institutional arrangements based on local conditions, usage technologies and external environments.

Table 3.2: Bundles of Use and Regulative Rights with Respect to Types of Water Rights Arrangements

Type of Rights Arrange-ments	Bundles of Use Rights				Bundles of Regulative Rights		
	Use Rights	Change Rights	Benefit Rights	Sell Rights	Mgt Rights	Exclusion Rights	Alienation Rights
URC							
PRC	x						
SRC	x	x			x		
GRC	x	x	x		x	x	
CRC	x	x	x	x	x	x	x

Source: Author's summary of community workshops and group discussions

The two other arrangements, state-regulated communal and privately regulated communal are set up by the state or by private investors, respectively. All state-regulated arrangements are more or less similar, both in terms of the content of use and regulative rights and in terms of the distribution of rights. According to the bylaw about state-regulated communal rights arrangements, the rights system grants two bundles of use rights (use rights and change rights) and one bundle of regulative rights (management rights) to co-owners. In a state-regulated communal arrangement, all

co-owners do not have equal management rights; parts of the management rights (those dealing with use rights) are assigned to a few individual co-owners (leaders of water-user associations), whilst the remaining management rights are exercised by the group of co-owners as a whole. In the case of privately regulated communal arrangements, farmers have clearly specified and exclusive, crop-specific use rights only. Depending on the type of contract, farmers are allowed to use the water to irrigate one or two types of crops. The decision about which crop to produce is largely determined by the water owner (the private investor). In this way, water owners not only have the power to influence decisions about water allocation, but also the production process and production choices. No regulative rights are granted to farmers under private communal arrangements.

The above classification of institutional arrangements based on number of bundles of rights only indicates the content of property rights associated with each property rights arrangement. Based on content of rights, it is hard to judge whether one property rights arrangement is superior to the others. It only indicates the content of property rights elements at status quo or as established by the initial contract; it does not show us the current status of the institutional arrangements. A complete property rights element of a particular property rights arrangement necessarily involves at least two sets of parameters: the number of bundles of property rights (use and regulative) and the associated quality parameters. The problem is that quality parameters are subjective and not observable for immediate classification. Their analysis requires using some subjective judgment, as well as data about individual perceptions and about the quality of a particular property rights arrangement.

For this particular purpose, we separately determined the quality of each rights arrangement for irrigation water, regardless of the number of bundles of use and of regulative rights granted in each institutional arrangement. We used randomly selected sample farms (60 from each water rights arrangement) to develop a quality index for property rights. Accordingly, information on individuals` perceptions of the quality of the rights system for irrigation water use and of the regulative rights system that a farmer was operating under were determined by submitting questionnaires at a farm level. We then constructed the indices for the quality of rights of a property rights system. This was done regardless of hierarchy and of the number of use and regulative rights, but was based on the farmers` perceptions of the quality of irrigation water rights they had acquired with respect to the four quality parameters (degree of rights specification, excludability, security and transferability). A score of 1 to 5 was assigned to the quality of each parameter: 1 for bad quality, 2 for poor quality, 3 for moderate quality, 4 for very good quality and 5 for excellent quality. The index for the quality of the total property rights system (t) of the ith farm relative to the score of the best quality rights system (s) is computed as:

$$q_{tsi} = \frac{\sum jR_{ijt}}{\sum jR_{ijs}}$$

where q_{tsi} is the quality of irrigation water rights acquired by i[th] farm at the time of interview, R_{ijt} is the quality score of the jth quality parameter for the ith farm and R_{ijs} is the score of the best quality rights of the jth quality parameter.

The mean, maximum, minimum values and the standard deviation of the estimated quality for irrigation water right arrangements are presented in Table 3.3. According to the table, URC exhibited the highest quality, followed by PRC, GRC and SRC. The lowest quality could be observed in URC.

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Table 3.3: Quality indices associated with property rights arrangements

Type of rights arrangement	Mean	Max	Min	St.d
Unregulated communal *(URC)*	0.25	0.35	0.05	0.31
Privately regulated communal *(PRC)*	0.825	0.90	0.75	0.097
State-regulated communal *(SRC)*	0.55	0.625	0.215	0.14
Group-regulated communal *(GRC)*	0.75	0.825	0.675	0.11
Corporation-regulated communal *(CRC)*	0.825	0.95	0.725	0.084

Once the quantity and quality parameters were determined, we were able to make comparative analyses of the rights arrangements. As the above results confirmed, the aforementioned institutional arrangements can be considered as different institutional arrangements, since they show significant and consistent differences both in terms of sets of property rights elements and in terms of quality and quantity of bundles of rights. This implies that individuals operating under these institutional arrangements can be considered to be operating in different institutional environments for the purpose of a comparative analysis.

Successful institutional arrangements for property rights are naturally evaluated in terms of the enforcement of property rules and norms that allow for the continued development of property rules. Thus, we can examine the effectiveness of the institutional arrangements by providing individual co-owners with efficient and effective property rights. For empirical analyses, it can be measured in terms of the concentration of individual co-owners' rights, which is the aggregation of the number of bundles of rights and of their respective quality parameters (equation 3.1). The computed use rights concentrations of individuals operating under different institutional arrangements are presented in Graph 3.1.

Graph 3.1: Use Rights Concentration of Farms Operating under the Five Institutional Arrangements
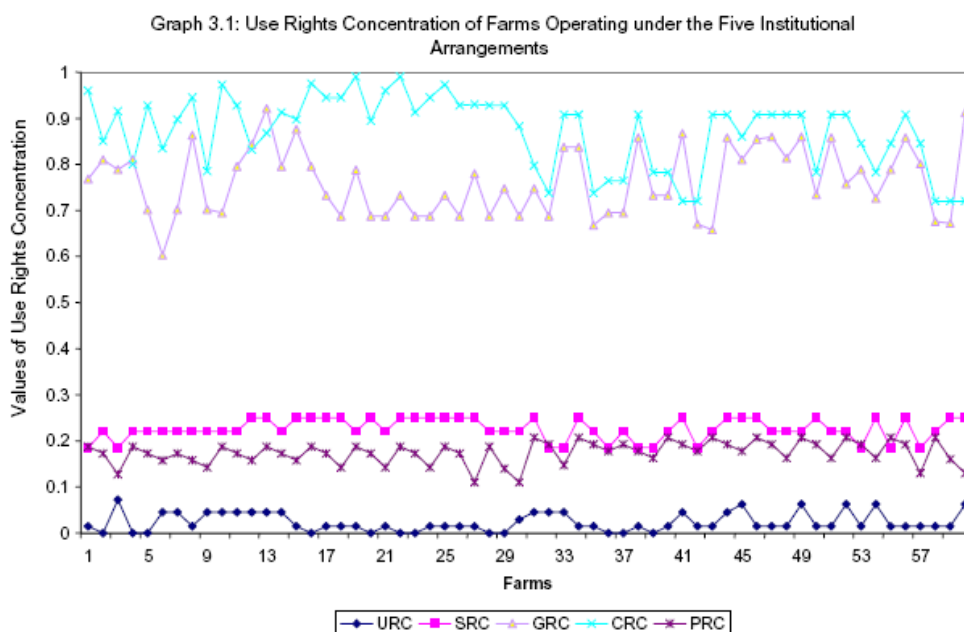
The graph shows us that co-owners operating under corporation-regulated communal arrangements have the highest concentration of use rights, followed by group-regulated communal, state-regulated communal and privately regulated communal arrangements. Co-owners operating under unregulated communal arrangements have the lowest use rights concentration. It can also be observed that the gaps in terms of co-owners' use rights concentrations between unregulated communal, privately regulated communal and state-regulated communal arrangements seems to be narrow. A wider gap can be observed between the two best institutional arrangements (CRC and GRC) and the three other institutional arrangements (SRC, PRC and URC). The smoothness of the lines also suggests a wider variability of co-owners' rights within the same type of institutional arrangement; this variability is very high in the case of the two best institutional arrangements. Based on this, one can conclude that group-regulated rights arrangements for communal irrigation water systems are superior to other institutional arrangements. They provide all co-owners with decentralized decision-making powers with regards to property rights, which allow individual co-owners to hold securely as many sticks in the bundle of property rights as they desire.

It is important to note that the above analysis gives us a clear picture of feasible interventions, in the sense that different institutional arrangements demand different policy measures. Considering all communal rights arrangements as a single type of rights arrangement may lead to policy recommendations of a massive property rights reform at the communal level, which may be inconsistent, or even contra-productive given existing institutional, social, economic and environmental conditions. As a result, a reform launched in the name of property rights may result in real risks rather than in improvements. Even if it fits the existing social and institutional conditions, it may not be efficient from an economic point of view. This is due to the fact that the same result can be obtained with minimal interventions (improving only the missing elements of the rights arrangements), without the need for a massive reform of the resource domain.

4.4.2. Structural Elements of Property Rights

In our framework, we have seen that three principal structural ares of property rights are of paramount importance to explain the deviations from the ideal property rights structure: *i)* the distribution of use rights and regulative rights, *ii)* the bundling of use rights and regulative rights, and *iii)* the aggregation of the systems of use rights and of regulative rights. In order to understand the sources of structural inefficiency and the magnitude of effects of each structural element, it is therefore important to at least estimate separate efficiency indices for the two types of rights (use and regulative). This enables us to examine the bundling of rights and their effects on farms operating under different institutional arrangements, so as to examine the aggregation of the two rights systems. The equity of the distribution of rights can be estimated for a single rights arrangement on the basis of the concentration distribution of individual rights within the system.

Aggregations of Use and Regulative Rights

For the aggregation analysis, we distinguished two types of farms: farms of regulative rights owners (thereafter: RRO farms) and farms of use rights owners (thereafter: URO farms). We divided our total sample into URO and RRO farms. The computed average, maximum, minimum and standard deviation of the composition of the aggregated rights system - in terms of use and regulative rights concentration indices for RRO farms and URO farms - are presented in Table 3.1. The average concentrations of regulative rights and use rights were found to be 0.675 and 0.725 for RRO farms. URO farms have no regulative rights; their mean use rights concentration was 0.475. The use rights concentration indices of URO farms were ranging from 0.050 to 0.675. A comparison across the two types of farms indicates that the average use rights concentration of RRO farms equates to 2/3 of the average concentration of URO farms. This observation can lead to the expectation that the average RRO farm is operating under a better institutional arrangement than the average URO farm and thus seems to exhibit better multilateral bargaining and Pareto efficiency outcomes. The standard deviation, minimum and maximum values of the rights concentration in Table 3.1 suggest the

existence of wider rights concentration variability (inequality of rights distribution) among co-owners across the three types of samples. The efficiency differences regarding property rights between the two types of farms can be explained in terms of sub-optimal aggregation of the two rights systems.

The relation between use and regulative rights can be explained in terms of an imbalance of the bargaining power: the lower the regulative rights concentration, the higher the difficulty of multilateral bargaining over the "rules of the game" aimed at improving the efficiency and security of use rights. Thus, a poor aggregation of regulative rights increases the opportunistic behavior of users in the provision of irrigation water, inefficient supply of use rights and problems over-appropriation. The effects of the concentration of use rights can be explained in a similar manner: the lower the concentration of use rights, the lower the gain from the resource and, thus the lower the incentives to invest time and efforts for bargaining over the rules and the collective investment. This in turn affects the transfer of water from an inefficient usage sector/user to a more efficient usage sector/user.

Bundling of Vectors of Use Rights and Regulative Rights

The above indices give us a general picture about the efficiency of the aggregated property rights of the total system and its two sub-systems (use rights system and regulative rights system). Further disaggregating the total system into its vectors of bundles of use rights and regulative rights may help us to address some important questions like 'what determines the content of the efficiency of a property rights system?' and 'which components of rights have more influence on the direction and magnitude of the efficiency and equity of distribution in the system?' Besides understanding the effects of each bundle of rights on the structure of the total rights system, it is important to note that property rights are a complex collection of separable bundles of rights that can be shared among many users. Each bundle of use rights can be held separately: use rights can for instance be held separately from change rights or from sell rights. Similarly, each bundle of regulative rights can be assigned separately or in a cumulative form to a single individual or to a group. This would imply that the way in which each bundle of use rights and regulative rights is bundled in order to form a property rights system has implications on the system's economic efficiency.

We measure the structure of bundling on the basis of the composition and concentration of each bundle of use rights (use, change, benefit and sell) and regulative rights (management, exclusion and alienation), measured with respect to the associated quality parameters, i.e.: *i)* the degree of rights specification *(Dsp)*, *ii)* the degree of rights transferability *(Drt)*, *iii)* the degree of rights exclusion *(Dex)* and *iv)* the degree of rights security *(Dse)* (as presented in Figure 3.4). The values obtained from individual respondents for the different bundles of rights are presented on the radar graph below (for the total sample). The radar graph systematically represents the relationship between each component of a property rights system and its associated quality parameters. The shaded areas represent the commutative concentration value of each bundle of rights held by an individual co-owner from the total sample in terms of four quality parameters ranging from a minimum concentration (a value of one) to a maximum concentration (a value of 5).

The radar graph shows that the concentration of use rights in the total sample has the highest value in the use rights system, followed by change benefit rights and sell rights. Similarly, within the regulative rights system, management rights seem to have the highest value, followed by exclusion rights and alienation rights.

Figure 3.4: Values of Property Rights Concentrations with Respect to Bundles of Use Rights and Regulative Rights (for the Total Sample)
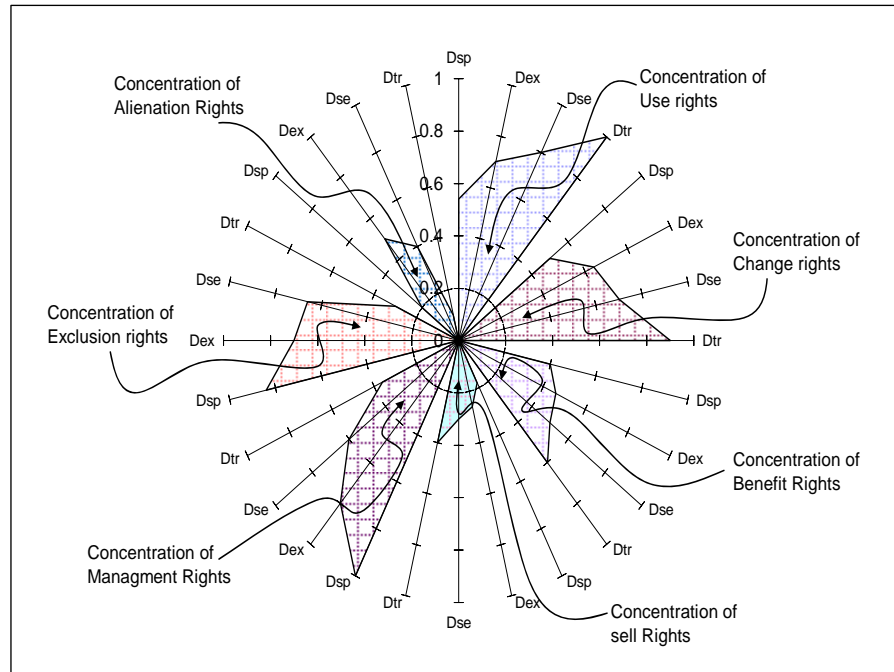

The figure further helps us to compare the different quality parameters of a particular bundle of rights. The degree of specification is for instance one of the most severe problems regarding *sell rights* (with a maximum value of 0.18), followed by the degree of exclusion (max. of 0.26), the degree of security (max. of 0.3) and the degree of transferability (max. of 0.4). This indicates that improving sell rights requires improving those problems in their respective order. It also indicates that there is not a large difference between the value of a bundle of use rights and a bundle of change rights for the total sample, although the degree of change rights transferability is lower (max. value of 0.9) than the degree of use rights transferability (max. value of 1). We can interpret the other values in a similar fashion. For instance, for alienation regulative rights, the degree of transferability is the most critical problem (max. value of 0.1), followed by the degree of specification (max. value of 0.2), the degree of security (max. value of 0.4) and the degree of exclusion (max. value of 0.5). The results obtained from the use rights and regulative rights systems are consistent with the view that the higher bundle is inclusive of the lower bundle of rights. This means that the lower bundle has to be established and enforced first before trying to improve the higher bundle of rights.

A comparison of the composition of the use rights system with respect to the two types of farms generally shows that RRO farms have a better concentration of use rights than URO farms regarding all bundles of use rights. This means that use rights are better bundled in RRO farms than in URO farms. This might be due to the fact that RRO farmers are operating under better institutional environments which allow individual co-owners to bargain over use rights and to hold the use rights they desire. The value of RRO farms and URO farms are presented in figures 3.5 and 3.6. The value of a use rights system across the two types of farms indicates similar results to those of the total sample in the sense that the higher the hierarchy of a bundle of rights in the system, the lower its contribution to the total system. This means that the concentration of the lower bundle of rights is increasing as we move from bundles of use rights (the lowest bundles of rights in the systems) to bundles of sell rights (the highest bundles of use rights in the system). The implication is similar to

the above explanation about hierarchy of rights: the lowest bundle of rights has to be granted first to in order to be able to grant the higher bundle of rights.

Figure 3.5: Property Rights Concentration Values with Respect to Bundles of Use Rights for RRO Farms
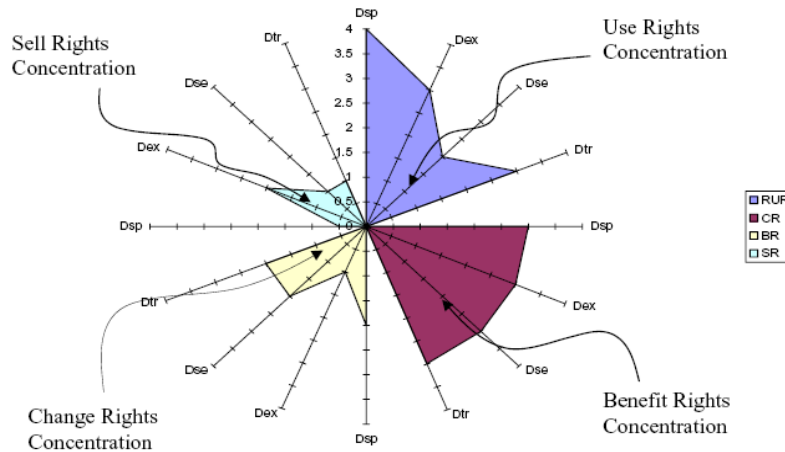
The differences in the concentration of bundles of rights across the two types of farms can be explained in terms of the associated quality parameters. As we can see from figures 3.5 and 3.6, the two types of farms are affected by different quality parameters. For RRO farms, for instance, the specification of use rights is considered to be the most important problem, followed by insecurity, exclusion and transferability, whereas for URO farms, transferability is reported as the most severe problem, followed by insecurity, specification and exclusion. The shaded areas indicate the existence of variability between co-owners for all four bundles of rights within a farm type and across farm types. This might be due to the variability both in terms of the quality parameters of the bundles of rights and in terms of the number of bundles of rights held by individual respondents in the system.

Figure 3.6: Property Rights Concentration Values with Respect to Bundles of Use Rights for URO Farms
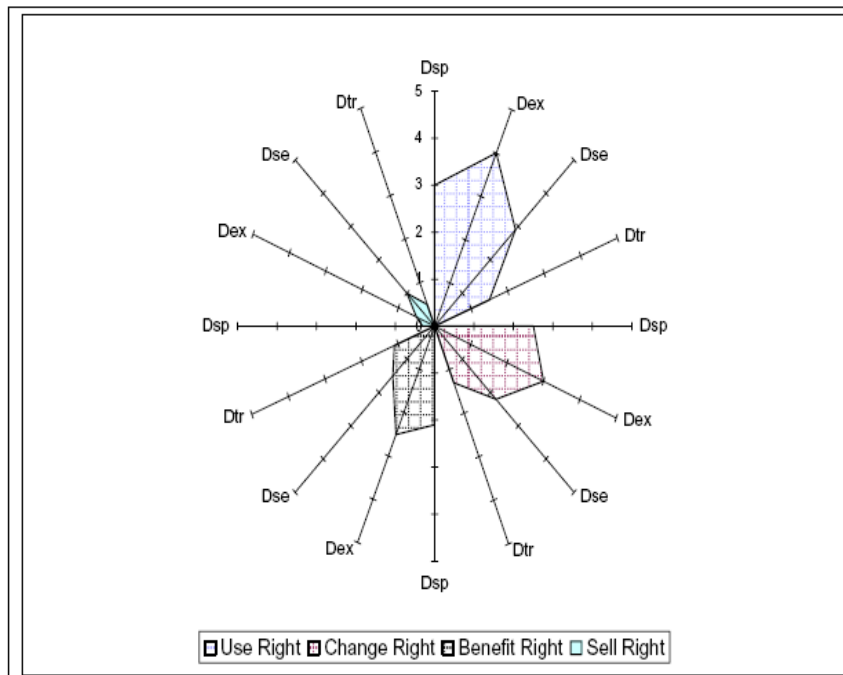
4.5 Conclusion

The whole exercise above shows us the efficiency of the current system of irrigation water rights through communal arrangements and detects the main sources of inefficiency in the studied rights arrangements. The decision whether to improve a particular missing element requires an analysis of the demand, since the demand of a particular rights system depends on the type of resource, the time, the place, the use and the objective function under consideration. Moreover, improving the missing elements of rights has benefits, but also involves costs. The alternative framework (the bundle of rights- centered framework) is quite helpful to develop a more in-depth understanding of the structure of a property rights system and to compare the efficiency of different institutional arrangements. It also helps us to detect the missing elements of rights. Once we understand the aggregated structure and its elements, it is straightforward to examine incentives associated with the aggregated property rights system and to determine incentives associated with each element of property rights.

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5 Preventing and Managing Natural Resource Conflicts in the Sahel. Experiences from Helvetas Mali

Aly Dama[10]
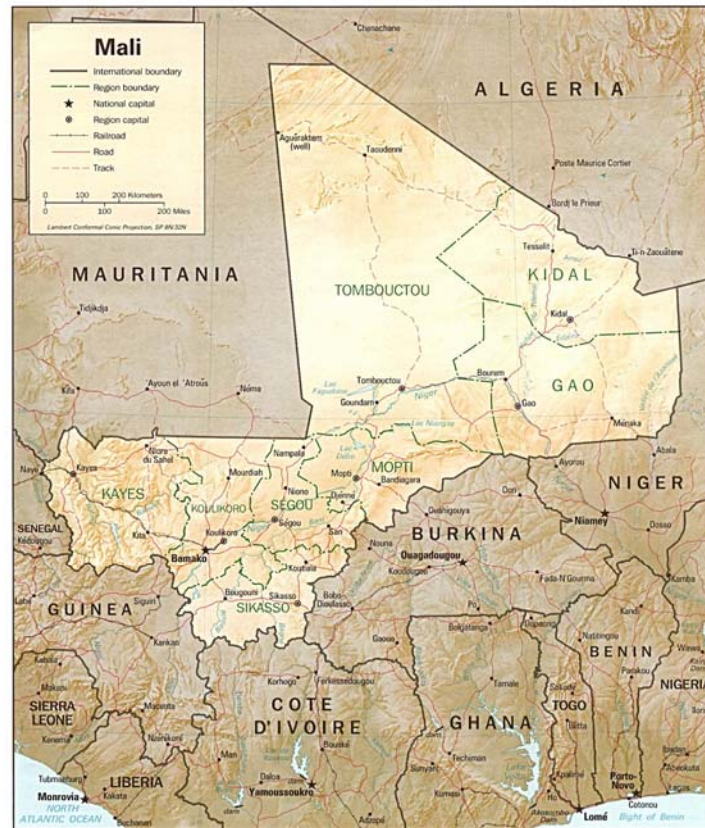
5.1 Introduction

Malian Western Sahel is located between the Kayes and Koulikoro regions of the Republic of Mali. It covers an area of 238,537 square kilometers and has an estimated total population of around 800'000. Several ethnic groups inhabit the region, namely the Soninké, the Pulaar, the Bambara, the Moor and the Diawambé. Administratively, Western Sahel shares its Northern border with the Islamic Republic of Mauritania and its North-Eastern border with Senegal. Due to transhumance, the conflict dynamics which are the focus of this paper also reached the Southern areas bordering the Republic of Guinea (in particular the Kita *cercle*[11] in the Kayes region).

Agriculture, transhumance and sedentary herding, as well as trade and handicraft are the main economic activities of the region. As a zone of encounters and human contacts, Western Sahel has a long tradition of co-existence between communities with different, yet complementary, lifestyles and production techniques. In the recent past, the region was an important commercial junction characterised by social intermingling and trans-Saharan trade. Today however, the area has become

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[11] Administrative division in Mali. Mali counts eight main regions subdivided in 49 *cercles*.

extremely vulnerable because of severe climatic difficulties and social tensions causing the displacement of almost 10% of its population.

But the social and climatic ruptures have not just caused population displacements. For those who stayed, the scarcity of means of subsistence caused by a sharp decrease in production and productivity have led, in the course of the last decade, to crises and tensions often developing into violent confrontations. These tensions have fuelled feelings of suspicion and mistrust among the different ethnic groups living in Western Sahel.

5.2 Patterns of conflicts in the Malian Sahel

Cycles of conflicts, followed by cooperation between the users competing for access to key natural resources have always been a characteristic of the production systems of Sahel countries. Historically, groups of pastoralists and livestock keepers had developed effective systems in order to negotiate access to resources and handle rising conflicts among themselves and, to a lesser degree, between them and other ethnic groups or systems of productions.

Presently this does not seem to be the case any longer, since we are witnessing a rise in the frequency, but also in the intensity of conflicts about land, trade routes or other resources between the different groups of users, as was the case in 1997 and 1999. The situation has become more complex since, with the eruption of violent conflicts that seem to have become endemic and chronic characteristics of the life of pastoralists - after years of political, economic and social instability. One of the main causes for these developments lies certainly in the weakness of our states (with regards to border control, security of individuals and goods, and the general institutional framework…), but this does not constitute the only element that bears on the access to resources as well as on the resolution of resource-related conflicts.

We have to recognise that the nature of conflicts has evolved. Natural resources are constantly becoming scarcer and more scattered over time and space. Customary institutions which enjoyed authority in the past have lost of their effectiveness and are being replaced by other forms of power. Finally, new, previously unknown, actors have emerged in the context of the crises affecting the region (Senegal-Mauritania, Guinea, Sierra Leone…).

5.3 The implementation procedure of the Helvetas-Mali Conflict Prevention and Management Programme

The aim of the programme is to contribute to the peaceful cohabitation between farmers, livestock keepers and shepherds in the transhumance zone. It has four main objectives:

- Supporting the process of relationship building between actors and favouring its organisational and institutional development at local, regional and national levels.
- Improving the conditions to access and control natural resources for users.
- Capacity-building in the fields of conflict prevention and management.
- Reinforcing local actors in their ability to deal with and manage conflict dynamics.

These objectives are pursued through the establishment of four pillars of intervention:

- Empowerment of consultation frameworks.
- Communication and information.
- Accompanying measures.
- Advocacy / lobbying.

The consultation framework is the main pillar around which the other pillars gravitate. The framework is established by the Pregesco programme, in collaboration with the various users of natural resources. The frameworks derive from existing producers' organisations and local regulation authorities in different locations. They are engaged in preventive actions and conflict management at local level, based on existing activities by village committees in this field. There are twenty consultation frameworks (spread among the three *cercles* of Mali) located on the transhumance route linking the Islamic Republic of Mauritania in the North to the Republic of Guinea in the South.

They constitute platforms for exchanges, consultation and negotiation between the different users of natural resources. Beyond their preventive action and conflict management activities, these organisations host debates about communal development in terms of rational and long-term management of natural resources in support of the local communities. These discussions are fuelled by the vast diversity of these frameworks and committees composed of farmers' organisations (both male and female), social and occupational groups and village communities. They also offer the administration and technical services an adequate platform to implement sectorial policies and represent a qualified interlocutor for questions relating to the management of natural resources.

The aim of the first pillar is therefore to support and empower consultation frameworks and committees in their activities in favour of social stability. Since the establishment of these frameworks and committees, their members have undertaken several trainings and were given numerous tools for effective conflict management.

The numerous benefits of the conflict prevention and management programme and the decrease of mistrust between actors have shown the capacities of the frameworks and committees to prevent and manage local conflicts and their legitimacy within their communities. At present, they constitute fields of experimentation for activities which will determine the communities' capacities for the transfer of competencies in natural resources management.

Conflict prevention and management frameworks as well as village committees supported by the programme do not, however, cover the complete area of the three *cercles*. Being local conflict prevention and management authorities linked to the access and control of natural resources – and hence evolving in a field of competence which is to be transferred to the communities - their action has to remain within the boundaries of the competences accepted by these communities.

The role of consultation frameworks as platforms for mediation, negotiation and reconciliation on question relating to the management of natural resources within and between groups is well accepted. The frameworks' actions remain however limited by the lack of resources for the implementation of their objectives. For the time being, Pregesco can offer limited support, which is however far from meeting all expectations. Certain community councils, recognising the importance of their work, are funded through communal budgets. In most cases, the opportunity for such financial support more often depends on the goodwill of elected officials than on an annual budget planning. This constitutes a weakness in a long term perspective.

The future challenge for these frameworks is to maintain their neutrality in the negotiation about conflicts linked to access and control of resources, but also to appear as a neutral actor to others (justice, administration…).

5.4 Case studies

First case: A deadly struggle over land

The case takes place in November 2006 during harvest time in the village of Simby in Western Sahel. El Hadji Kane, a shepherd from the neighbouring village, is herding his sheep in surrounding pastures, looking for crops left over from the harvest. The animals escape and enter a field belonging

to Checkiné Coulibaly whose harvest is not finished yet. The animals destroy large parts of the harvest. Once informed, the infuriated farmer returns immediately to his field and starts a heated discussion with El Hadji. A bloody fight breaks out between them; El Hadji is transported to the hospital, but dies soon after because of the severity of his injuries.

The mayor took up the case, informing the consultation committee as well as the judicial authorities. He expressed the wish that all sides await the conclusions of the local authority which was given the responsibility to start negotiations between the parties. This case reminded the incidents of 1997 which started precisely in the village of Simby and led to more than a hundred casualties, left thousand injured and caused important displacement movements as well as two consecutive seasons of anarchy and abandonment of fertile lands because of the insecurity the local populations were facing.

Starting the community-based conflict resolution mechanism, the consultation framework analysed the situation before engaging in actions in favour of the victims within the community. From a violation of the prohibition to graze animals in the vicinity of fields without sufficient guard, the case had developed into a tragic incident causing a man's death. While the date of the release of the fields had not passed yet, means of recourse for the claimants existed.

After two weeks of negotiations, the victims accepted an out-of-court settlement on 24 November. A collective declaration was agreed upon, signed by the mayors of both villages, the consultation framework as well as the parties to the dispute and announced the following day. A letter was addressed to the president of the court before the hearing of the case on 9 January 2007.

The court's verdict was the following:

" … Given the result of the debates, a sufficient basis for charges against the aforementioned for a physical assault on 11 November 2006 in Simbi, resulting in severe injuries […] against Mr. El Hadji Kane could be established. The injuries inflicted resulted in the working incapacity of the victim […]; Given that the plaintiff renounced his rights to file a suit by written communication on the date of 8 January 2007,

For these reasons, [The court] publicly pronounces the following judgement […]:

The court finds Checkine Coulibaly guilty of the charges laid out against him and sentences him to a suspended sentence of three (3) months; notes and acknowledges the withdrawal of Mr. El Hadji Kane[…]"

Commentaries:

A case for manslaughter could have been brought before the criminal court, with all judicial implications and potentially negative consequences for the social stability.

On the basis of an inter-group negotiation supported by the local authorities, the court **voluntarily left out parts of the case in its conclusions** in order to keep the incident on a local level and prevent further damage.

Traditional mechanisms can be effective if they are given adequate means of action. Their solutions are based on past, present and future relationships between local actors, dialogue and consensus rather than on textbook application of laws which often favour the emergence of a winner-loser situation rather than looking for greater social justice.

The approach chosen for the resolution of this conflict shows the possible interplay between grassroots organisations and judicial bodies in order to reach greater social justice as a basis for peace and sustainable development.

Second case: Mali-Mauritania cross-border meeting in the village of Gogui

The events of 1997 led to the emergence of a new phenomenon in the Sahel region, caused by the porosity of the national borders of Mali. Armed robbers found shelter in the region and started launching raids against herds and capturing cattle belonging to sedentary and semi-sedentary communities. As a reaction, violent reprisals were carried out against nomad communities considered responsible for the attacks. This led to a general confusion affecting all local communities. The signing of peace agreements between the communities in August 1998 and the establishment of 14 security posts along the border decided by the local and national authorities provided an immediate response to the crisis; these decisions could not, however, provide a long-term solution as long as other factors were not being adequately dealt with. Those other factors included namely the access to natural resources by non-residents and border policy issues, which were seriously hampering population movements on both sides of the border.

After several negotiations with both Malian and Mauritanian authorities, a meeting was organised in the village of Gogui in December 2005. This meeting offered the communities the opportunity to discuss urgent matters affecting the daily lives of the local populations without raising issues relating to territorial sovereignty. The issues discussed were the following:

- Difficulties linked to transhumance (paths, shelters, water points, transhumance certificates).
- Local answers to cross-border robbery.
- Rraids against herds and thefts at cattle markets.
- Revitalisation of consultations between villages under the auspices of the consultation frameworks. In the past, such cross-border consultations had often been successful in handling cross-border issues without the intervention of the national authorities of both states. Thus, the institutionalisation of the consultation frameworks as cross-border mediation platforms seemed necessary in order to offer a local response to the difficulties that had arisen.
- Translation into local languages and popularisation of Malian and Mauritanian texts relating to the management of natural resources.

In the end, this meeting on a community level raised political issues that then led political decision-makers to continue the process on a larger scale: the intercommunity space established between ten villages from the Mauritarian region of Hods and the ten others from the Malian region of Kayes contributes today to perpetuate the dialogue initiated at the meeting through, among others, regular meetings of political and administrative decision-makers every six months.

At present, the aggressions carried out against nomad pastoralists carrying official documents have almost disappeared, robbers are being chased even by their fellow countrymen, a programme for the maintenance of dust roads was launched by development partners, the institutionalisation of consultation between village communities has become a reality and their contribution is considered satisfying by their respective populations, communication materials on the management of natural resources are now available in local languages and many other initiatives contributing to a more harmonious cohabitation between communities were launched.

5.5 General conclusions

1. What are the causes and main factors of conflict dynamics in agricultural and pastoral societies in Mali?

The first factor of these dynamics relates to ecological disturbances in the Sahel region, namely to climate and vegetation issues. **In years of abundance** for example, very few conflicts emerge

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between the different production systems. Plentiful resources also contribute to better relations between ethnic groups around socio-cultural activities. In such periods however, intra-ethnic conflicts between farmers are frequent because of quarrels about lands abandoned long before and which are now used for other purposes.

In years of average harvests, increased competition about available resources constitutes a factor exacerbating the dynamics of intra- and inter-group conflicts where some groups are able to prevent other groups from accessing vital resources. This phenomenon is of particular gravity for groups of pastoralists who lose their lands to farmers and often express their frustration by violent means in the Sahel region, as was shown previously.

In years of drought, severe difficulties affect almost all production systems. Major competition between the different actors breaks out when survival is at stake. According to the **Centre for Ecological Monitoring of Western Africa based in Dakar, Senegal,** droughts in the Sahel region have followed a cyclical pattern over the last forty years. Since 1962, Mali was affected by five major disruptions of its ecosystem: in 1962, in 1970-73, in 1984-85, in 1992-93 and in 2002, each one lasting one to two years. The frequency of the phenomena is thus decennial. Most major social upheavals in the Sahel region were preceded by a drought period. Analysts therefore consider that each drought in Mali resulted in social conflicts at regional, or often even at national, level.

2. The political options and judicial framework of land and conflict management

Policies developed following a drought period focussed on subsistence agriculture to the detriment of other production systems. So far, Sahelian governments refused to recognise the economic importance and the ecological contribution of the pastoral sector.

Decades of centralised state control have also deprived local communities and resource users of the responsibility to manage natural resources and conflicts over those resources. The formal judicial system which has replaced customary systems is both inappropriate and ineffective. Judicial systems in force tend to encourage winner-loser situations rather than consensus and in many cases, state authorities are more prone to apply legal texts to the letter than to search for more social justice. This approach opposes traditional systems which tend to focus on reconciliation rather than on retribution. Another difficulty stems from the fact that formal judicial procedures are often inaccessible to the majority of the population because of their complexity, cost and frequent corruption among officials.

Example: *An investigation we held in the Diéma* cercle *revealed that over the period of 2004-2006, almost 50 millions CFA Francs had been invested in schools and health facilities by the communities and that an equivalent sum had been used over the previous three years to bribe officials.*

In Mali however, the situation is more promising now than it was a decade ago. The number of community-based organisations representing civil society is increasing and they have gained legitimacy. While these organisations remain weak in institutional terms, government initiatives aiming at a greater decentralisation as well as the adoption of important reforms, such as a legal code on property and state-owned lands and a pastoral charter, have enabled these civil society organisations to negotiate with state authorities and to contribute to reforms regarding the livelihood and means of subsistence of the local population. The challenge is now to provide these groups with competencies enabling them to benefit from these opportunities.

3. The transformation of production systems and the evolution of agro-pastoral societies

Long lasting droughts have led to a continual decrease in specialisation. Specialised farmers and shepherds are now exceptions. Often, both activities are exercised on the same parcel, which leads to the erosion of complementary relations that favoured their mutual interdependence and sensibility for their respective difficulties during certain periods of the year.

Example: *Contracts of exchange of dung for leftovers from the harvest or barter of milk and meat for cereals…* This was a characteristic of relationships between agriculture and livestock farming.

Moreover, agriculture in the Sahel region becomes more extensive through the introduction of mechanisation. Large areas of deforested lands have reduced the number of usable land and the competition between production systems have often led to the degradation of the natural environment. At the same time, farming has kept its traditional characteristics and its space has become more and more restricted, which goes against its need for mobility in the Sahelian context.

4. Multi-dimensional forces and consequences of neighbouring crises

Nowadays, we witness an increase in the frequency and intensity of conflicts between different groups of users regarding lands and other resources. These can not be attributed solely to legal frameworks, climate or social change. They are also caused by international, multi-dimensional forces which the populations don't understand or over which they have little control. In the case of Malian Western Sahel, the numerous refugees displaced by the crisis between Senegal and Mauritania in 1987 who found shelter in the Sahel region led to increased pressure and competition regarding access to natural resources. Moreover, the implication of Sahelian expatriates in central Africa, Europe or the United States promoting solely the interests of their respective communities have often contributed to exacerbate the conflicts and make the search for local solutions more difficult. A last element aggravating tensions and intensifying violence is the large availability of automatic weapons, primarily in the border areas.

5. Who are the actors or groups of actors involved in the conflicts and what are their interests and their power relations?

In the case of Malian Western Sahel, we can distinguish between three groups of actors:

- Natives: farmers and stock breeders, residents working in different sectors, state representatives.
- Foreign-born temporary residents: transhumance shepherds, refugees and other non-residents.
- International actors: expatriates, relatives and allies with whom the refugees have maintained contacts.

The natives' primary aim is to affirm their rights as original residents or exclusive land owners (state).

The foreign-born legitimate their claims by their protected status (refugees) or by their status as nationals, yet not natives to the region.

The international actors' objective is to support the community they claim to be representing.

A distinction between these power relations needs however to be done when conflicts are taken on a jurisdictional level. In that case, the power balance switches in favour of the two latter groups because of their better predispositions to corrupt law official in order to win their trials.

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6. What roles do the state and civil society play?

In the case of the conflict in Malian Sahel, the state played an important role through the launch of the first peace initiatives based on the experience in the Far North in 1990-1991.[12] The state succeeded in initiating dialogue through the establishment of a commission of good offices composed of experts, which managed to bring the conflicting parties to the negotiation table and have them sign inter-community peace agreements as well as to guarantee the security of the border areas by building fourteen security posts which are now supported by national and international development partners. The state then organised a round table on the development of the region bringing together international aid organisations, civil society and local actors. The participation of the population was essential at every level; if the initiatives came from the state, their approach was essentially societal, which enabled the organisations of civil society to identify with them.

7. The role that international cooperation and development actors play or should play

International cooperation has been present at the request of the government since the first initiatives in the conflict. International cooperation and development actors have made contributions to various activities ranging from the phases of negotiation of the peace agreements to the launch of the recovery plan to counter economic disparities, based on the discussions of the round-table for the development of the Sahel region. In that regard, an inter-ministerial commission was established in order to evaluate the recovery plan, which is mainly funded by international donors, nationals and the state itself.

An important effort by international cooperation actors is however requested in the fields of advocacy/lobbying activities in order to better adjust state policies to local specificities, but also - and perhaps more importantly - in terms of funding of local development.

8. Lessons learnt from our experience in the Sahel region

It is necessary to clarify the rights and obligations of the various users of natural resources, to provide local populations with the competences to negotiate agreements with other groups and with the government, to set up modern institutional dispositions for better negotiations and conflict management and to ensure **that the negotiated solutions are confirmed on a legal level.** The capacity of local actors to engage in constructive debates about legal texts governing their daily lives before their adoption by the national parliament is essential in order to guarantee a better adequacy and a respect of the policies regarding natural resources management. The state's role would lie in the definition of a general framework, leaving the concrete implementation to local authorities in charge of regulations and social stability.

The current context of decentralisation offers an opportunity to seek endogenous solutions through a participatory, inclusive approach involving all relevant actors, even the weakest ones (such as livestock breeders, women or youth).

The balance of the relationships between the different production systems with regards to access and control of agricultural, pastoral and forest areas is an important condition for long-term peace in the Sahel region. Changes in the balance of power from a year to the next or between groups are a typical feature of the relationships between the different systems of production. The situation

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[12] Arab-Berber armed conflicts opposing Tuareg and the Malian state.

becomes however dangerous if one group manages, on the basis of endogenous or exogenous factors, to exclude another group completely from accessing vital natural resources.

Helvetas-Mali's programme on the prevention and management of conflicts linked to the access and control of agricultural, pastoral and forest areas has been in line with this logic of intervention since 2003. The programme has contributed to the establishment of a conflict prevention and management mechanism through the support of consultation dynamics in the field of management of agricultural, pastoral and forest areas. The start of the process of transfer of competences to decentralised authorities in terms of natural resource management is a great opportunity. The programme focuses today on the empowerment of community-based organisations, so that they can benefit from the opportunities the ongoing reforms are offering them; we are convinced that disorganised, under-informed and vulnerable populations cannot benefit from such opportunities.

6 Switzerland, the UN and Environmental Peacebuilding

Peter Maurer[13]

Despite a wide range of academic research on environmental peacebuilding, not much has been done so far to assess how the UN could improve its action in this field and on how member states could assist in raising awarness for this complex issue.

My first remark would be that, while sustainable development is a broadly used and quite clearly defined concept, this is not yet the case with environmental peacebuilding. I will therefore start by outlining trends in the area of environment and peacebuilding respectively which should then allow me to highlight the intersections of both.

6.1 Trends in the area of environment

The Rio Conference has triggered the development of a broad range of policies, norms and institutions. More than 30 multilateral environmental agreements (MEAs) have been negotiated to date. There is a rising number of conferences of parties, secretariats, expert panels and funds which are linked to the UN. The UN Framework Convention on Climate Change (UNFCCC) is a very prominent example. The UN Environment Programme (UNEP) according to its mandate is the environmental pillar of the UN system, while the UN Environment Management Group (EMG) with its 44 participating units serves as an indicator for sprawling environment activities of the global MEAs, the UN specialised agencies, the Funds and Programmes and different units of the UN Secretariat.

Cooperation between the UN Development Programme (UNDP) and UNEP has become the core of environmental operational activities at the field level. Similarly, the Global Environment Facility (GEF) helped by providing grants to developing countries for projects relevant to global environmental protection such as biodiversity, climate change, organic pollutants, deforestation, land degradation, international waters and ozone. And while the Bali Strategic Plan remains the key document for country specific capacity-building on the environment, regional development banks have played a crucial role in the financing of environment activities at national and regional levels.

The term "UN environmental pillar" suggests thematic unity. Nevertheless, the environment as a political agenda falls hostage to the approaches and sensitivities behind which different groups of states gather. And although there is a growing awareness for the interlinkages between sustainable resource management and development, only few admit a direct connection between environment challenges and the prevention of conflict. Thus, the current debate on environmental security and peacebuilding remains an often fragmented, uncoordinated and sometimes even ideological debate over issues such as state sovereignty, good governance and technology transfer.

6.2 Trends in the area of peace and security

The UN has developed a considerable number of new peace and security tools over the past 15 years. Today, the biggest budgets are allocated to peacekeeping, post-conflict peacebuilding and humanitarian aid. The UN is currently conducting 17 peacekeeping missions and 11 political missions in key zones of conflict. Once the Hybrid Mission in Darfur will be in place, there will be over 140'000 persons engaged in UN peacekeeping and the budget will rise to over 7 billion USD per year.

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[13] Ambassador, Permanent Representative of Switzerland to the United Nations in New York.

Although most funds are still spent on reaction, important developments have taken place in areas of prevention and mediation. The recognition of the responsibility to protect in the 2005 Millennium Summit + 5 Outcome Document constitutes a milestone at the conceptual as well as systemic level. At the institutional level, the creation of a new UN Peacebuilding Commission as well as the Mediation Support and Rule of Law Units have helped to strengthen the preventive capacity of the UN. A more systematic collaboration between the Bureau for Crisis Prevention and Recovery (BCPR) at UNDP and the Department for Political Affairs within the Framework Team has increased synergies and information sharing. Moreover, research and policy shaping has led to the creation of new tools in complex and multidisciplinary areas such as Disarmament, Demobilisation and Reintegration, Security Sector Reform or Transitional Justice.

6.3 Overcoming the silo approach

Although terms like "mainstreaming" and "crosscutting" are gaining popularity, the UN agenda is still shaped along traditional chapters such as Peace and Security, Economic and Social Development, Human Rights and Humanitarian Assistance. Environmental issues are rarely framed as relating or even contributing to economic development, even less as contributors to peace and security. In other words: while both pillars, environment and security, have shown dynamic evolutions, the focus on linkages between them is far less pronounced than the nexus between environment and development.

There have, however, been important developments. In 2007 the Security Council held four open debates on various aspects of conflict prevention. Two of these discussions were concerned with environmental issues: the UK led a debate on security aspects of climate change while Belgium initiated an open discussion on natural resources and conflict. Both events confirmed that natural resources play a substantial role in armed conflicts and that the Security Council should take more preventive action in this field. Both debates highlighted a lack of conceptual clarity and expertise on relevant issues such as border disputes, migration, management of natural resources and energy supplies, or natural resource control regimes and sanctions regimes.

Environmental peacebuilding gained further momentum from the environmental and developmental oriented Funds and Programmes in particular in the context of the debate on climate change. It has become a generally accepted assumption that climate change will seriously impact on vital resources - especially on agricultural land and freshwater - and thus not only jeopardize the prospect of achieving the Millennium Development Goals but also fuel new and potentially wide-spread conflicts. The Environmental Risk project of UNEP and analyses undertaken by the private sector have confirmed and detailed some of the earlier findings. Vulnerability and risk analysis made clear that environmental degradation and natural disaster have the potential to destabilize countries or entire regions if they are coupled with economic and social underdevelopment.

6.4 New Trends

While the debate is still new in UN fora, some important trends are recognizable - most in the form of good ideas but some also include first and concrete steps forward. There are several levels at which this question needs to be addressed: (i) conceptual level; (ii) operational level; (iii) governance level; (iv) information sharing and knowledge management; (v) instruments and (vi) partnerships.

From a *conceptual angle*, there is a clear need for a political agenda which goes beyond the mere recognition that environment and conflict are interlinked. In this sense, the study "Linking Environment and Conflict Prevention: The Role of the United Nations" is a first step in the right

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direction[14]. The authors, based at the Centre for Security Studies (CSS) and swisspeace, differentiate between three different types of environment-related conflicts. Firstly, there is the so called "resource curse" where the commercial use of locally abundant but globally scarce resources such as oil and diamonds lead to armed conflict. Secondly, there are conflicts related to "local and regional resource scarcity", namely in subsistance economies if vital resources such as water and land are insufficiently available or if there is no equitable access to them. Thirdly, there are the "conflict hot spots", where both elements are at work. The study proves that grouping environment related conflicts into different categories makes it easier to identify the right set of measures to address a specific situation.

Also, there have been some developments at the *operational level*. A prominent theme is the current debate over how best to respond to climate change. In this context, the adaptation, mitigation, technology and finance agendas have significantly evolved over the past year. The current discussion on how to reduce the adverse impact of climate change is particularly relevant for peacebuilding and sustainable development. Early warning systems and the increase in disaster and conflict preparedness play a crucial role. The need for operational plans for environmental refugees is also being addressed. In that context it is particularly relevant to understand how the international peace and security machinery should be capacitated to respond to various environmental dimensions of conflict. How can peace expertise enrich environmental work and environmental expertise support peacebuilding initiatives?

The call for stronger institutions as well as for more cooperation and coordination has become a widely accepted priciple in discussions over *international environmental governance*. But environmental governance still lacks key building blocks such as scientific assessment capacity, coordination and cooperation schemes, finance and related mechanisms as well as regional and national capacity. In that sense it is encouraging to see that the Peacebuilding Commission is just starting to include environmental dimensions into national peacebuidling strategies and that UNDP and UNEP are beginning to formalize agreements on how to enhance cooperation at the country level.

Moreover, the ongoing reform of system-wide coherence of the UN family and the plan to "deliver as one" are further important entry points to integrated development, security and environmental approaches. The High-level Panel on System-wide Coherence in the areas of Development, Humanitarian Assistance, and Environment, the informal consultations of the General Assembly on environment and the recent debates in the Governing Council have all supported the conclusion that UNEP should be upgraded with a renewed mandate and improved funding and that the Global Environment Facility should be strengthened. In short, there is a clear signal from the part of UN Member States to address International Environmental Governance (IEG) reform.

On the other hand, not much has been done so far to improve *information sharing and knowledge management* in the area of environment and conflict. Current initiatives to develop new information technology schemes either focus on peacebuilding or on environment, but seldom contain a authoritative overview of existing best practice or lessons learnt on environment related conflict prevention.

While existing lessons from the field clearly indicate that there are no quick fixes and no one-fits-all solutions at the operational level, there are still important gaps with regard to *working instruments and tool-kits*, such as mediation guidelines for resource sharing, training modules on environmental

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[14] See Mason, Simon A., Albrecht Schnabel, Adrian Müller, Rina Alluri, Christian Schmid. 2008. *Linking Environment and Conflict Prevention: The Role of the United Nations*. Zurich: CSS; Berne: swisspeace.
http://www.swisspeace.ch/typo3/fileadmin/user_upload/pdf/publications_by_staff/UNstudy_Long-June-2008_FH.pdf

diplomacy, interactive information management tools; environmental indicators for peace-building strategies, specific sanctions regimes and guidelines to improve environmental sensitivity of peacekeeping missions, development and scaling up of positive experiences like the Extractive Industry Initiative or natural resource certification schemes like the Kimberley process.

Finally, a lot of potential also lies at the level of *global partnerships*. Since its creation in 2000 the UN Global Compact has fostered recognition for the significant role the private sector plays in the areas of sustainable development and conflict prevention. Its commonly adopted standards have a strong focus on human rights, labour standards, environmental protection and corruption. The political relevance of this initiative for environmental peacebuilding was underlined at the Global Compact Leaders Summit 2007 at Geneva, where climate change and environmental governance figured prominently on the conference agenda. One of the adopted recommendations stressed the importance that companies set aggressive and precise targets and make a business case of environmental sustainability to stimulate best practices.

6.5 Strengths and weaknesses of the UN

The strenghts and the weaknesses of the UN are very straightforward and a list of advantages and disadvantages can be compiled as follows:

On the one hand, the UN is well suited to deal with issues of environmental security for the following reasons: it comprises 60 years of accumulated knowledge and experience in the relevant fields; it has the political legitimacy to enact general norms and codices; its membership is universal; its funds and programmes cover the whole spectrum of relevant experience and operational expertise at field level; it generates finance through assessed as well as voluntary contributions; its political and institutional structure provides a unique basis for integrated approaches.

On the other hand, the size and complexity of the UN results in a high degree of fragmentation and bureaucratization. In spite of a relatively high degree of institutional independence of the Special Organisations and Funds and Programmes each entity remains state driven whereby a top-down approach prevails.

Although the Security Council bears the primary responsibility to maintain international peace and security, its main focus has traditionally been on managing already existing conflicts. This was due to the unwillingness of some Council Members to get involved in internal conflicts. Discussing issues of environmental security in the Council is even more difficult, as many members of the UN fear an encroachment over social and economic issues which do not fall under the authority of the council, or see their sovereignty over their natural resources threatened.

But as already mentioned, recent debates have shown that more preventive action from the Security Council is needed and that natural resources and their sustainable management play an important role in conflict prevention. However, it also became clear that there is a lack of expertise within the Council and not enough advise from the Secretariat on issues of environmental peacemaking and peacebuilding.

One lesson the Secretary-General drew was that the preventive capacity of the UN Secretariat has to be strengthened. This includes the need to enhance its capacity to address natural resource management early in a peace process and to include environmental aspects in post-conflict peacebuilding.

While the strengthening of the Secretariat is probably the least controversial among outstanding reform issues, improving systemic coherence between conflict prevention and environmental protection is a far bigger and much more complex challenge. Even more so, as we are dealing here with a typical cross-cutting issue with a high degree of political sensitivity.

The creation of a new entity within the UN will not solve the problem. On the contrary, the experience from establishing a new peacebuilding architecture has shown that the creation of new entities without a prior conceptual definition leads to resource problems, parallelisms and competitions.

Similarly, a recently emerging consensus indicates that the current structure of international environmental governance and the governance for sustainable development do not have the capacity to face the growing environmental challenges. Despite this recognition, however, the main area of disagreement remains how to address these problems. The need to strengthen the environmental pillar by upgrading UNEP into a United Nations Environment Organisation (UNEO) has repeatedly been underlined. Still, a considerable number of UN members doubt whether a specialized agency for the environment will solve the systemic problems of the current system. Yet, there is a growing convergence of opinions that the environmental pillar within the UN is underrepresented in terms of political status and that it needs to be strengthened.

6.6 What role can Switzerland play?

Being a Member State of the UN Switzerland can do two things: reinforce the strenghts and adress the weaknesses of the Organisation. There are different means by which it can engage at the political as well as at the operational level.

At the *political level*, Switzerland should ensure its own coordinated approach in all key intergovernmental fora: the General Assembly, the Economic and Social Council and its related Commissions, the Security Council, the Peacebuilding Commission, the specialized Funds, Agencies and Programmes, and Conferences of Parties to Multilateral Environmental Agreements. Switzerland should furthermore engage for stronger governance on cross-cutting issues whenever they are the content of UN Resolutions. It can attempt to shape Presidential Statements of the Security Council by helping to clarify concepts and identify possible lines of action.

At a more operational level Switzerland should try to win the support of less and least developed countries for a new narrative on environment related poverty reduction and peacebuilding. It should raise awareness for the problematic by systematically highlighting economic advantages of and stability gains from environmental protection. This could be done, for example, through the financing of innovative pioneer projects, the mandating of authoritative assessments or by investing in tools, training and information technology-based knowledge management systems.

I should like to conclude by underlining that conflict prevention, peacebuilding, environmental security are relatively new and above all knowledge-intensive and multidisciplinary issues. Combined expertise is therefore necessary to develop practical solutions. Switzerland must continue its close collaboration with academic institutions and think tanks to explore new niches and instruments. It should also provide - whenever possible - this expertise to the UN.

The Study "Linking Environment and Conflict Prevention - The role of the UN" mandated by the Federal Department of Foreign Affairs and conducted in cooperation with swisspeace and ETH/CSS provides a first basis for a more informed examination of how Switzerland can help to improve UN response to environmental security issues.

Annex 1.
PhD theses written within the 'Environmental Conflicts'
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