

***IASCP Europe Regional Meeting***  
**Building the European Commons: from Open Fields to Open  
Source**  
*Brescia - Italy - March 23-25,2006*

New lessons for collective action: Institutional change of Common Pool Resource (CPR) management in the Rufiji Floodplain, coast region Tanzania.

**Author:** Patrick Meroka  
Ph.D candidate  
Department of social Anthropology,  
University of Zurich  
Andreastrasse 15  
CH-8050 Zurich  
Tel. 0041 44 635 22 32  
Fax 0041 44 635 22 19  
Meroka2004@yahoo.de

\*See foot-note

**Abstract**

Since the work of Mancur Olson (1965) on collective action, the question remains on the conditions under which this is possible (Ostrom 1990, Wade 1988, Baland and Platteau 1996, Ruttan 1998, Ostrom et al. 2002, Agarwal 2002). Regarding the factors influence group characteristics, group size and homogeneity of interest have been mentioned as important (see Agarwal 2002 but see also Becker and Ostrom 1995 and Ensminger 1992, Ensminger and Knight 1997). The case of the management of fish and wildlife in the Rufiji floodplain illustrates that as well as distance and locality in relation to market chains, demand for cash and differences in demand for specific CPR are important in determining the way CPRs can be managed successfully through collective action. The comparison of CPR institutions in two different village settings in the Rufiji floodplain shows that these factors matter significantly. Studies have been done in two village settings by the author between 2002 and 2004, of which one was further away in the floodplain closer to the Selous Game Reserve and to wildlife trade routes. The other village is situated closer to the market centre Ikwiriri located on the main road connecting Mozambique with the capital of Tanzania, Dar es Salaam. In this location the demand for fish and timber is high. Both settings differ considerably in the management of the CPRs. The village further away from the market centres is able to act collectively in order to manage floodplain-related lakes for a sustainable fishery. This is achieved by reintroducing traditional conservation methods and collective fishing institutions. But the other village closer to the market place fails to do so as the village is composed of various ethnic groups with varying interests in CPRs. But at the same time, successful collective action in the first village is not possible regarding wildlife management, as the market for this resource has attracted more people to the business.

Due to the economic and political constrains that the state faces today, the management of the CPRs is mainly under the control of powerful individuals, who have manipulated and shaped the political system in their personal interests. The customary laws, which promoted collective action, have been replaced with formal laws, giving the external actors powers on resource management and extraction.

The paper will explain these differences and link them to the institutional change in Tanzania since colonial and Ujamaa times. However, it is important to see how locality and access to markets are important factors influencing the development of sustainable CPR institutions. Therefore, of successful collective action coping with the open

access dilemma, which emerged by a de facto open access situation stemming from the ineffective CPR management by the state.

## ***Introduction***

The research was done by Patrick Meroka, a doctoral student from Switzerland, University of Zurich, and took place in the Rufiji floodplain, which is inhabited by different ethnic groups collectively called (Warufiji). The Rufiji floodplain is important for common pool resources (CPRs) such as wildlife, fisheries, forests and pastures, as well as land for agriculture. The Rufiji people had established institutions governing CPRs in pre-independence times, which were changed by colonial (German and British) and post-independence governments, especially by the socialist Ujamaa-policy of villagisation. Today, under structural adjustment programmes (SAP) and the restructuring of the state towards more privatisation of state services, different people are involved in the CPR-management (state officials (national and district level), local and commercial immigrant fishermen and hunters, traders, non-governmental organisations).

The research was looking at CPR management among the Rufiji people in two village areas. It was aimed at investigating and showing how the Rufiji people managed the common pool resources (CPR) such as fisheries, wildlife and pasture in the pre-colonial times, and how traditional rules and regulations (institutions) governing CPRs have been transformed during colonial times and after independence.

The paper shows which traditional rules were working for the management of fish and wildlife and how the colonial and independent post-colonial administration replaced these traditional institutions. These institutions gradually eroded after the socialist state government under Ujamaa (pulling together) took over the management of CPRs from the lineage/clan elders and government departmental sectors become in charge. The customary laws defined clearly who was allowed to use a resource as well as who would supervise the resources and how defaulters were punished. These laws have been replaced with new formal laws, which support the government agendas but lack recognition of the local institutions set up and their role in CPR management. The new state laws are said to have given the external resource users from the urban centres and other rural areas in the country a lot of powers over the management and extraction of fisheries, wildlife, timber and pasture.

One of the major problems is that the traditional institutions were declared illegal immediately as the Nyerere government took over power from the British colonial government in the early 1960s. The new state laws abolished and weakened the traditional institutions and the lineage leaders were either retained as mere political consultants at the local level or were to operate under the leadership of the government village chairman. The new formal laws are now hardly implemented by the government institutions due to lack of trained human resources and financial support. This has led to the situation that fisheries, wildlife and forest resources have become open resources for everybody. The changes in politics have affected the CPR management and everybody could go and profit from these resources without any control, as the government is totally unable to revamp its institutions to manage these resources.

The absence of strong state institutions combined with high-tech corruption has contributed to over harvesting of the CPRs in the Rufiji floodplain today. To control such problems, NGOs, conservationists and district authorities are trying to educate the local people on the dangers of overexploitation and the wise use of fisheries, wildlife and forests products. However, the local communities are supposed to participate actively in the management of the CPRs within their village land. Still, there is a lack of incentives from the state to guarantee security in resource

tenure for these local groups. In addition, the local villagers have problems among themselves because some individuals or ethnic groups are more powerful politically and that has created inequality in access and profit distribution. In spite of the mutual interest of the local groups to protect the resources and use them for a livelihood, the presence of the external users from urban centres or other rural areas have made the management difficult as competition rises. Lack of functional CPR institutions to organise and co-ordinate the interested groups in resources use has opened a functional dilemma as the power struggle continued among the government departments. The question is how can the demands and interest of all interested groups wanting access to fish, game, land and timber be satisfied without using too much of all these resources. Lack of functional regulatory agency to lay down rules, punish deviant behaviour, collect access fees, impose contributions on users, monitor and make the users accountable for their conduct has ruined the stability of the natural resources in the region today. According to oral information, access to CPRs in the area was connected to membership, kinship and local residence of different ethnic groups in the pre-colonial times, which is not the case today. Nowadays all people are Tanzanians and have therefore the right to get access to the resources at will through the ideology of citizenship. The citizenship ideology, which is locally recognised as pure democracy, has ruined the stocks of resources in many parts of the rural areas such as Rufiji. The citizenship ideology has promoted nationalism and that is why its application today continues to protect the traders and urban resource users despite the recent changes in policies on CPR management. The ideology fails to teach the locals their duties on resource extraction and management but dwells on rights of access. That is why the protection of the natural resources is a complicated issue for the new institutions. The local villagers are, through the state policies, hand-cuffed to exclude the so-called potential resource users as the state continues to protect their interests because of the payments made for licence acquisition to access the CPR. However, Rufiji had been a remote area for a long time. The recent improvement of roads and bridges, combined with the current market values of the CPRs in the urban centres, more people are visiting the area on a daily basis in search of CPR opportunities. It was said that urban people have an impact not only on the resources but also on the social-economic and political organisation of the local people.

## **Literature review**

Since the work of Mancur Olson (1965), which is considered as zero contribution thesis through Hardin's "tragedy of commons" (1968), to many scholars taking cognisance of voluntary associations that are creating and enforcing rules that protect natural resources. Literature published in last two decades provided ample evidence to this. Field research has established today that though temptation to free ride on the provision of collective benefit is a universal problem, self-organised resource governance too has survived in multiple generations (Ostrom, 1990). It is also found that when the users of a common-pool resource organise themselves to devise and enforce some of their own basic rules, they tend to manage local resources more suitably than when rules are externally imposed on them (Tang, 1992; Baland and Platteau, 1996; Wade, 1994).

Among the writings of many scholars, Robert Wade, Elinor Ostrom and Jean-Marie Baland and Jean-Philippe Platteau are significant because of their analyses of sustainable management efforts of common property resources. After wide ranging discussions and considerations of many factors, each arrive at a set of conditions and conclusions that they believe to be critical to sustainability of commons institutions. Wade's (1988, 1994) important work examines when it is that corporate institutions arise in villages and what accounts for their success in resolving

common dilemmas, and provides set of reasons about successful management of commons. Small group size, clear boundaries, and ease in monitoring and enforcement are some of the conditions, according to him, which determine the effectiveness of rules.

Ostrom (1990) has designed 8 principles, which are essential elements or working tools that help to account for the success of these institutions in sustaining the CPR and gaining the compliance of generation after generation of appropriators to the rules in use (1990:90). These are clearly defined boundaries, monitoring, collective-choice arrangements, congruence, conflict-resolving mechanisms, and minimal recognition of rights to organise, and nested enterprises. Later, Ostrom further suggested attributes of the resource and attributes of the appropriators that are conducive to an increased likelihood that self-governing associations will form (Ostrom, 1999a).

Baland and Platteau have reviewed large number of studies on commons too. They suggest that the failure of CPR in comparison to privatisation rest on the comparison between an idealised fully efficient private property system and the situation created by open access (1996:175). They suggest incorporation of cultural and political factors into analysis to know when people co-operate, and when inverted opportunists dominate and make collective action impossible. Small size of user group, location close to the resource, homogeneity among group members, effective enforcement mechanism, and past experience of co-operation are some factors necessary to achieve co-operation. Characteristics of the resource as substantive factor affecting effectiveness of institutions governing the commons too are varied.

Collective action is seen as is a social dilemma problem concerning provision, the CPR management problem is a dilemma concerning taking (van Dijk and Wilke 2000). A group of people rely on benefits they extract from a shared resource. If every resource user takes as much of the resource as he desires, the resource will be ruined (e.g., the lake would be over-fished). This ruin would not take place all at once; while the collective harm accumulates, each user would notice only marginal deterioration in his own benefit until the resource reached its capacity for exploitation and suddenly became unusable (Hardin 1968).

The collective action and CPR problems are based on a set of assumptions about human nature that fall under the rubric of "rational choice." Individuals are self-interested meaning that they make rational choices based on individual cost-benefit calculations after considering all available information. If given the opportunity, they free ride (take advantage of the contributions or restraint of others) and resist the free riding of others. Communication and credible commitment among group members nearly is impossible. Individuals will co-operate only if co-ordination materially serves their personal interests.

Olson (1965, 1982) wrote extensively on collective action, and many authors, including Dawes and Orbell (1981), have contributed to this literature. Hardin (1968) established the CPR problem as the "tragedy of the commons" and his arguments prompted CPR management debates across the spectrum of social science disciplines. Axelrod's (1981, 1984) Prisoner's Dilemma captures the essence of the collective action and CPR problems by eliminating the provision/taking consideration and describing a scenario in which two individuals would benefit from co-operation but each would gain more if the other co-operated while he himself did not.

Rational choice scholars are not optimistic about the potential for co-operation in CPR and collective action dilemmas. They explain successes by arguing that selective incentives change an individual's calculus so that public goods provision is sufficiently self-serving (Olson 1982). When an individual is utterly sure that the success or failure of a collective action initiative he values hinges upon his choice to co-ordinate, he may co-operate (Hardin 1985). The individuals in the Prisoner's Dilemma may co-operate if they interact repeatedly and thus can anticipate

and co-ordinate behaviour, as long as neither discounts the future too heavily and the time span for interaction is indefinite (Axelrod 1981, 1984).

The conditions necessary for success rarely obtain under these narrow assumptions about human motivation. Sociologists, anthropologists, and social psychologists, among others, are more optimistic about co-operative prospects and recognise that successful analysis of social dilemmas requires a broader perspective.

In the CPR context of mutual resource reliance, the dominant individual incentive is neither free riding nor refusal to co-operate, but rather co-ordination (Runge 1984, 1992). Co-operation then depends on assurance of the preferences and intentions of others (Robertson and Tang 1995). Rational choice theory argues that credible commitment is only rarely possible, but other theorists point out that even its approximation, the extent of inter-group communication, correlates with improved potential for co-operative outcomes (Ostrom 1990, 1992, 1998, Oakerson 1986, Hackett, Schlager and Walker 1994, Chen and Komorita 1994). Individuals rarely make choices in the context of complete information and often rely on past experiences, observations, impressions, and heuristics to make decisions that do not appear narrowly rational (Schlager 2002, Allison and Kerr 1994).

The free-riding impulse is problematic on resources considered to be common but may not always exist, if group members are influenced by social norms (Simmons and Schwartz-Shea 1993). Social cohesion, evidenced by a sense of community pride and identification, may convince individuals that working for a communal benefit is to their advantage, despite a cost that would indicate the opposite. A community with dense social networks is more likely to succeed at collective action, as is a community with meaningful socialisation mechanisms (Marwell, Oliver and Prael 1988, Knoke 1988, Gachter and Fehr 1999).

Community heterogeneity can aid or hinder collective action (Heckathorn 1992, Hackett, Schlager and Walker 1994, Marwell, Oliver and Prael 1988). Olson's work, for example, emphasises group size and provision of selective incentives, whereas Hardin stresses the need for external, binding governance of the commons. Ostrom stresses communication and the importance of supportive institutions, and social psychology authors discuss the value of a prototypical community leader.

In this paper I will explain the impact of collective action as emphasised in the literature and link it to two examples of fisheries and wildlife management in the Rufiji floodplain.

### ***Objectives, Hypothesis and Methods of the Research***

#### ***Objectives***

The overall objective was to identify and assess the degradation of these commonly used resources in the Rufiji floodplain area and to analyse the role the absence of binding rules and regulations plays in this process. Therefore, the researcher was interested in understanding how and by which cultural means resources were managed in pre-colonial and colonial times compared to Ujamaa times and the times after Ujamaa. The research was also about understanding power relations and if there were conflicts over these resources and if there was a possibility to solve them. As the researcher was looking at two village areas, it was of interest to understand if there were differences between the two areas in regard of how local people were able to solve the problem of acting collectively in order to address overuse of resources and mismanagement.

#### ***Hypothesis of research***

Dismantling of local institutions and lack of strong state institutions lead to de facto open access and contributed to the degradation of fish, wildlife, and forests and powerful actors shape local rules for their gains. Thereby these resources leave the area for the market and locals do not have any interest in protecting the resources unless they are empowered to control them in co-operation with the state. But this only works if the state actors fulfil their duties and if feelings of trust between the village and the district level can be increased. Not all the villages face the same problems and are capable of acting collectively. This depends on the nature of the resource and the kind of marketing possibilities as well as proximity to market centres.

### ***Methods for data collection***

The research methods used were a variety of tools from social sciences, especially from Anthropology but as well as from Geography: These were participant observation, the keeping of a daily diary, oral history, indigenous resource mapping, transect diagrams, photographs, focus groups interviews, questionnaires and structured as well as semi-structured interviews.

### ***The research areas in the floodplain***

The Rufiji district is between the latitudes 7.47° and 8.03°S and longitudes 38.62° and 39.17°E. The district covers an area of approximately 14,500 km<sup>2</sup>, making an average population density of 14 persons per km<sup>2</sup>. The Rufiji district has an overall mean altitude of less than 500 metres. Its vegetation comprises mainly tropical forests and grasslands. The average annual precipitation in the district is 800–1000 mm. A prominent feature of the district is the Rufiji River, with its large floodplain and delta, the most extensive in the country. The temperature ranges from 25°C to 41°C throughout the year with two rainy seasons. The short rains (Vuli) start from October to December and the long rains (Masika) from February to May with an annual average rainfall of (1,096 mm) at the coast to semi-arid (600mm) levels in the western floodplain and has a generally bimodal pattern with wide annual variation (M. Yoshida 1974). This area is semi-arid, characterised by flooding during the rainy season. Most of the resources (such as fish, forest, pastures, water, wild products, wildlife, agricultural land) are today held as common property and characterised by extreme seasonal variations in natural conditions throughout the year. The areas of study are two twin-villages in the floodplain namely: Mtanza-Msona and Mbunju/Mvuleni.

**Mtanza/ Msona** is one of the villages in the western floodplain situated at an elevation closer to Rufiji River as well as Lake Mtanza. The village has a population of 1774 inhabitants, 455 households with an average of 3.8 persons per household. The residential area is located on the northern side of the river but most of the economic activities such as cultivation are done south of the river. The village land is said to have a width of approximately 12 kilometres and extends southwestwards to the Selous Game Reserve boundary and north-east to the border of Kisarawe District.

The settled area is small, stretched along the Rufiji River, on the northern side, unless under extreme cases, the unpredictable floods do not affect this area and the villagers have their traditional houses permanently. The villagers therefore maintain two homes, one in the settlement area on the highland (Ujamaa village) and the other in the floodplain where cultivation takes place. The homes in the floodplain are temporary and are known as dungus, the stilt houses that keep them high above the floods and fairly safe from the wild animals. The dungus are said to be the original houses of the villagers before the villagisation process, which

took place in the late 1960s in Rufiji floodplain, and later became a national programme for the government of Tanzania. This programme was introduced in other parts of the country in the early 1970s and was implemented through the socialist Ujamaa policies.

Mtanza/Msona village is blessed with large concentrations of wild animals from the month of August through December in each year. These animals are attracted by the presence of water and forage on village land. The main animals found in the village during this period are elephants, lions, buffaloes, hippopotamus, crocodiles, leopards, giraffes, zebra, impala, hare, spotted hyenas, yellow baboons, monkeys, bush pigs and several snakes and birds. With such a variety of wild animals, hunting is a common practice attracting local hunters as well those from the neighbouring district. The wildlife products originating in the Rufiji district are transported through Kisarawe, which is well known for wildlife products business.

Hunters from Kisarawe District and Dar es Salaam conduct hunting on the northern portion of the village while tourist-hunting companies do it on the southern portion on the village land. Not all hunters report to the village council of their activities and therefore it is assumed that their hunting is illegal.

The villagers consider farming as their primary economic activity. Fishing is taken to be a secondary activity by most of the villagers and a refuge during the hunger and floods period. Fish catches are boosted probably by the raised water level in the flooding season. Other natural resources of importance to the villagers are; poles for building, trees for timber cutting and fuel wood, canoe making, logs and wild palm products. The households with secure livelihoods are less dependent on one economic activity but have a range of sources of income. The villagers survive by buying food with cash earned from logging, hunting but sometimes relief food is supplied by the government.

**Mbunju/Mvuleni** is located in the central floodplain area of the Rufiji District on the northern elevated area of the Rufiji River, the biggest river in Tanzania. The village is 54 km<sup>2</sup> from the district headquarter Utete and 15 km<sup>2</sup> from Ikwiriri Township. It is accessible throughout the year by an earth motor road. According to the census 2002, Mbunju/Mvuleni village has a population of 1,445 people, 360 households in five (Vitongoji) sub-villages (Kilalani, Mbunju, Mpima, Mupi and Mvuleni). The village records an average of 4.01 persons per household, which is smaller than the Rufiji District average of 4.49 persons per household. It is one of the 98 registered villages in the district and shares boundaries with Mngaru to the west and North, Utunge/Nyanda, to the South, Mgomba/Ikwiriri Township to East and Ruwe village to the west. The main village settlements and farming areas are approximately 10 kilometres north of the main Rufiji River. The main settlement is in two sub-villages of the Mbunju and Mvuleni villages along the road that crosses the village from Ikwiriri to Mkongo (division head quarter). The Mvuleni sub-village is a few metres from Lake Ruwe and likewise, Mbunju sub-village is a few metres from Lake Uba, which is shared with Mpima sub-village. The villagers are used to maintaining two homes, one being a permanent home (Ujamaa village) on the highland and the other a farmhouse (dungus) in the floodplain located inside the floodplain.<sup>1</sup> These farmhouses are the original houses owned by the villagers before Villagisation took place in the 1970s. Thereafter, the farmhouses in the floodplain were declared illegal by the state and the government burned down many of these houses (dungus) through the deployment of the

---

<sup>1</sup> *Dungus* are traditional houses for the Rufiji people before their relocation from the floodplain to the highland. Today these houses are called farmhouses to avoid conflicts from the authority because the state condemned such structures in the 1970s. However, the natives are not allowed to stay in the floodplain while many of the older generation spend much of their time in the floodplain for farming activities. The highland houses are partly used in the year.

military forces in 1974 (operation Vijiji).<sup>2</sup> Officially, all the inhabitants in the floodplain lost their traditional ownership of the land and resources after the government rebated them from the fertile soils in the lowland to the sandy new settlements on the highlands for protection against the floods. The people's religion is mainly Islam, but still the villagers believe in spirits (animistic believes) and have special shrines spread all over in the community forest as well as along the shores of lake Uba for worshipping. The village is blessed with large concentrations of wild animals from the month of August through December in each year. The majority of the wild animals come all the way from the Selous Game Reserve following Ruhoi River. The presence of water and plenty of grass in the wet season attracts these animals closer to the village settlements. The main animals found here are the same as those in Mtanza/Msona village. The hunting of these animals is less common compared to Mtanza/Msona, as the market for the wildlife products is limited in this region. The village being near to the Ikwiriri Township, there is a ready market for poached meat but of low quantity. Mbunju/Mvuleni is not a typical traditional rural village, but is composed of diverse ethnic groups due to the villagisation process and the continued immigration of people from other regions in search of the CPR opportunities has made it known to the outside world.

### ***Ecology, history and culture of the Rufiji Floodplain***

#### ***Ecology***

The prominent feature in the Rufiji District is the Rufiji River, which is 177.4 km long with a large floodplain and delta. It is the largest river in Tanzania, which has a catchment area of about one-fifth of the country's territory. Rufiji District has an overall mean altitude of less than 500 metres. Its vegetation is mainly formed of tropical forests and grasslands. The average annual precipitation in the district is 800–1000 mm. The area is therefore semi-arid and the only reason for its richness in resources such as fish, wildlife and agricultural area is the large amount of water transported by the Rufiji River and its tributaries such as the Great Ruaha and Kilombero Rivers. Together, these combine to form the Rufiji River Basin, extending for almost 177,000 km<sup>2</sup> or about 20% of the surface of Tanzania, comprising 10% of the country's population and 30% of its surface water. The vegetation in the floodplain is influenced by climatic variations, rainfall and soil conditions. Grasses, including *Echinochloa pyramidalis* and *Oryza* spp, dominate the Rufiji floodplain. The permanent swamps along the rivers are the cyperus papyrus swamps, with the normal associated species. Upstream, the rivers carry gallery forests, with zones of inundation and pockets of swamp forest.

The fauna in this region include fish (breams, catfish, citharinus, oreochromus, protopterus), crocodiles, hippopotamus, elephants, Zebras, antelopes other smaller wildlife. The floodplain is flooded during the long rains in the months of February to May. This area is semi-arid, characterised by flooding during the rainy season. Most of the resources (such as fish, forest, pastures, water, wild products, wildlife, agricultural land) are today held as common property and characterised by extreme seasonal variations in natural conditions throughout the year.

#### ***Ethno-professional groups in pre-colonial times***

---

<sup>2</sup> Operation Vijijini was a term used during the relocation of the people from their former settlements in the south floodplain to the new villages, which were situated on higher grounds north of the Rufiji River.

\* The NCCR North-South financed the research in Rufiji, Tanzania: Research Partnerships for Mitigating Syndromes of Global Change, subproject IP 6 (Institutional Change and Livelihood Strategies).



In the pre-colonial time the local people were organised in societies, which were under the leadership of the traditional Mpindo ruler, who was assisted by a council of Ukoo elders. The management and distribution of CPRs like fish, bush meat, pasture and water was organised through this structure. This council of elders was to keep peace and order in the lineage or clan. The traditional ruler and the council of elders administered the local courts but the traditional ruler made the final decisions once the council of elders was satisfied with the evidence given. The territorial boundaries were observed at all times and resources within the lineage or clan were open to the lineage members in all seasons, but reciprocity was applied in time of need. The colonial government changed the functions of the traditional ruler through the introduction of indirect rule. However, the colonial government retained the traditional rulers and the management of the common pool resources was done through the application of the government policies, which restricted the locals' free entry to the resource sites without permission from the government official. The ethnic groups in Rufiji floodplain before the dismantling of the traditional institutions by the state had different economic activities based on their social-economic background in the pre-independence time. However, the groups inhabited the same floodplain and their traditional culture and beliefs governed the access, monitoring, and sanctioning of the CPRs. The table below is the outlined summary of ethnic groups and their economic activities in the pre-independence and post-independence times.

Ethnic groups	Number of people in percentage	Mobility	Livelihood strategies		Recognised place of residence	
			Pre-indep.	Post-indep.	Pre-indep.	Post-indep.
Ndengereko	44%	sedentary	Farming, keeping of small animals	Farming, fishing, Logging, poultry	Floodplain	Highland Mbunju/Mvuleni
Makonde	16%	sedentary	Fishing, haunting	Farming, fishing logging	Floodplain	Highland Mbunju/Mvuleni
Ngindo	12%	Semi-sedentary	Beekeeping, hunting,	Farming, fishing honey collection	Floodplain Magongo	Highland mbunju/Mvuleni
pogoro	6%	sedentary	Farming, fishing	Farming, fishing Logging, business	Floodplain	Highland Mbunju/mvuleni
Matumbi	20%	Semi-sedentary	Forest product cultivation	Farming, fishing Logging, hunting	Floodplain	Highland Mbunju/mvuleni
Nyanza	2%	Semi-sedentary	Fishing, net making	Farming, fishing, net making	Floodplain	Highland Mbunju/mvuleni
Ngoni	2%	sedentary	Farming,	mixed farming, fishing,	Floodplain	Highland Mbunju/mvuleni

All these groups had CPR areas changing during seasons governed by lineage leaders and only through lineage membership the interested users were allowed access to CPRs within the lineage territory. In the traditional institutions external users requests were carefully analysed before extraction was permitted for subsistence use. However, lineage traditions accepted sharing of resources cross border in time of need the lineage norms and traditions were to be

observed. It was forbidden to turn away neighbours seeking access to the resources but under special circumstances the lineage leaders had to get satisfactory reasons for giving access to external users in order to avoid misuse of the resource.

### ***Institutional Changes and CPR management***

Moorehead (1989) and Thomas (1996) show that the changes taking place in African floodplain areas are related to the political regimes and economic changes, which have taken place since the 1950s. During colonial and post-independence times, the control over and the responsibility for resource management were increasingly taken out of the hands of local user groups by the state. In most cases the state is now defining the rules of access to the CPRs. It decides whom, when, and how access to resources is given by distributing licences and permits to those who are able to pay the highest price.

There are other reasons for the massive overuse of CPRs in floodplain wetlands and deltas. Monetisation and commercialisation of resources, as well as institutional rules changed by the state or influenced by powerful local and national actors with capital, have led to monopoly constellations and the overuse of former CPRs, which were under the management of traditional institutions in the 1950s.

Today, most local people do not have the money to buy food and are forced to switch over to more marginal resources, which are then overexploited in order to make a living. Under these circumstances, the anger among local CPR users rises. They become willing to use violence against the newcomers and against one another in the fight over resources, which are becoming increasingly scarcer (see Thomas 1996).

Tension is also rising within local communities because the adoption of new technologies and the possibilities of new market options have led to the erosion of the traditional monitoring structures and organisations, which once ruled the use of the CPRs.

### ***Changes in colonial times and after independence (Ujamaa)***

During colonial times, local traditional institutions in Rufiji floodplain were getting weaker as the colonial government introduced indirect rule in the region. Despite this changes traditional institutions were still in place but got only more or less abolished by the independent government during the introduction of Ujamaa policy (lit. "Pulling together") in 1960s. After the introduction of Ujamaa, the political change in the Rufiji floodplain affected the management of the common pool resources drastically. Local ethno-professional groups stopped to exist in the same way as before because the government declared all people Tanzanians and the ethnical boundaries were dismantled and consolidated into state villages. The traditional rules and regulations were restructured and replaced by state institutions supported by formal government laws. The management of common pool resources, which were linked to local culture and beliefs, gradually eroded and disappeared in some areas. The dismantling of these institutions and their replacement with state institutions took place in 1968. The president of the Republic of Tanzania introduced Ujamaa as a means of development and unity in Tanzania. The implementation of Ujamaa policies weakened the traditional institutions in the following way: The traditional leadership was abolished and new village governments were introduced and all the scattered hamlets were consolidated to Ujamaa villages. Despite ethnic differences, people were mixed together.

The powers of the local leaders were reduced and their positions in administration were scrapped and taken by the village government representatives at the local level. The tasks and

duties of the former leaders were declared illegal and traditional courts at the local level were closed. The Ujamaa policies gave the President the power to control land and all the common pool resources in the entire country. The customary ownership of land was transferred to the office of the President, who became the trustee of land in the whole country. The traditional boundaries were no longer reorganised and all Tanzanians were allowed to move to any part of the country as they wished, irrespective of their locality. The dismantling of the traditional institutions paved the way to open access in common pool resources in the floodplain as well as in other parts of the country. The change of political regimes in Tanzania has affected the social-political structure of the Rufiji people. The new regimes changed the informal customary laws and regulations (institutions) and replaced them with constitutional laws. The village government supports the new political structure. But these did not have the same powers as the traditional Mpindo leaders had before to manage the fish and the wildlife because sanctioning mechanisms were lacking. In addition, the administration of the village chairman is not effective because the consolidation of the different households into Ujamaa villages made the entire administration complicated and difficult. Formerly, the local leaders controlled, regulated and managed all the resources on behalf of the lineage or clan members. Now, village chairmen protect the needs and interests of the state.

This new political system supports the larger groups, which are loyal to the ruling party and sidelines the opposition and many of the members from minority groups in common pool resource management. By this, the larger ethnic groups had more power to execute control. The government posts were distributed unevenly and this led to conflicts in the village between the village government officials and the villagers from minority groups. The political change in Rufiji and other parts of Tanzania has contributed to mismanagement of the common pool resources. The newly formed state institutions are not capable of delivering services to the local communities and that has led to mistrust at the local level. So, in spite of having all Tanzanians profit from the state, parts of the local communities could not participate in decision-making. However, the decentralisation process is already in place but the government lacks manpower and finance to implement it.

Not only have the political changes affected the social life of the Rufiji people but also the new economic policies introduced in the 1980s have transformed the rural economy forcing many people to change their main livelihood strategies. The Structural Adjustment Programme introduced in the 1980s by the IMF to consolidate state expenditure and meet the debt of the state led to major economic changes not only in Rufiji area. The government was forced to start privatisation programmes to reduce the state expenditure whereby working staff were massively reduced but with the same workload. Therefore, the state could no longer manage the resources effectively but the notion that resources are free for all Tanzanians remained. Access to CPR under state control was also getting easy, as state officials in charge of controlling these resources were badly paid and therefore susceptible to corruption. An increase in CPR users also developed by the privatisation of the formerly state owned irrigation schemes, releasing a lot of workers in search of alternative forms of livelihoods. At the same time, the closure of cotton ginnery and the breakdown of co-operatives in the area increased the interest in commercial CPR use as an alternative. Also, through the building of new infrastructure (roads, bridges), the area Rufiji becomes an interesting resource area close to urban centres, such as Dar es Salaam, for a lot of Tanzanians wanting to use fish, wildlife, timber, charcoal etc for sale. All these external developments increased the interest in the commercial use of the resources in Rufiji compared to other regions of Tanzania such as, for example, the Pangani area, which had seen economic changes much earlier (for example with coffee production). Therefore, Rufiji was getting more and more attractive and the use of fish, timber and wildlife a

more interesting means to get cash compared to other ways of making a living. So, new people are coming to Rufiji such as traders, commercial hunters and fishermen. They can use the resources more or less free because the local rules do not work anymore and the new state rules are not effective either. Easy access now is another reason why so many people are interested in fish, game and timber.

But it is not only newcomers who are interested in the commercial side of these resources. The other crucial issue in the villages where research was done is that the village government officials are not on the government pay roll. However, most of the government duties at the village level have to be administered by the village government officials on behalf of the central government. As they act as custodians of resources worth millions of Tanzanian shillings and are not paid any salary by the government, they are forced to look for alternative strategies to earn a livelihood for their families. (It was said why taking care of a cow, which does not help our children but the master and his children shines, while we are starving here watching as the cow is being milked.) Today local people, especially young men, are no longer interested in farming but have realised that common property resources can be converted into money. Today they make money out of the CPRs themselves directly or they co-operate with traders and commercial fishermen, hunters or loggers. Most important, local groups do now everything because the ethnical work division no longer exists. Therefore, all local people do many things at the same time for survival reasons.

To conclude we can state that locality, seasonality and the composition of ethnic groups on the resource site influenced the management of the CPRs in the floodplain. Many rules were embedded in religious beliefs which helped to co-ordinate and regulate resource use activities. As already mentioned colonial but especially Ujamaa policies changed the internal structure of resource management and exposed them to all actors who are interested in the CPRs. The replacement of the customary land tenure and transferring the resource and land to the office of the president left the traditional institutions weaker than in the colonial times. The management of the CPRs today is quite different as compared to the past. In the pre-colonial time the traditional institutions managed the resources according to the interest of ethno professional groups, who designed how the CPR was to be used and managed and the users were to respect the customs and beliefs. We believe that this has contributed to the sustainable use of CPRs because it co-ordinated resource use, activities were monitored and misuse sanctioned. The interest of the ethno-professional groups was not overlapping like today and that is why resources were manageable, however, these groups shared the same ecosystem and the conflicts magnitude was very low. The fact that the members within the different pre-colonial ethno-professional group had more or less the same interests made the management of the resources and resolution of conflicts related to the use of the CPRs relatively easy.

### ***Characteristic of resources and institutional changes***

#### ***Fishing and institutional change in Rufiji floodplain***

The use of boats and nets for fishing is considered to be a modern method, which was introduced to the floodplain in the early 1970s by the Malawi nationals (Wanyanza). The local elders resisted at first the use of nets, which later became one of the important fishing methods in the region. The replacement of traditional fishing methods with net fishing led to the breakdown of traditional management of fish in the Rufiji floodplain lakes. Net fishing encouraged more people to join the fishing sector. The introduction of boats in the fishing

sector led to the opening of boat construction using forest materials. Most of the durable trees, which take many years to mature, are now cut down for the construction of fishing boats. The construction of fishing boats has opened business for the young people in the floodplain. A reasonable number of fishermen have managed to control the fishing business by lending out their boats at a fee to fishermen, who do not own private boats for fishing.

The old rules for the management and access to the fishing grounds were replaced with formal fishing laws, which opened the resource to new users. The formal bylaws protect the new resource users and promoted the commercialisation of the resource, which in the process attracted distant fishermen to the floodplain. The change of pre-independence institutions and the emergence of the new state institutions contributed to the depletion of the resource, which gradually affected the livelihood of the local communities.

Many of the floodplain communities depend on the resource as a source of protein, income and food today. Fishing is done according to seasons in the floodplain. Between the months of June and December fishing is done for commercial reasons. This time almost all men in the village engage in fishing activity. During this period, the village granaries are empty and the source of food is fishing. The household budget and other expenses depend on the daily catch. From the start of October until the end of February the fishing activity in the floodplain is for subsistence purposes. At this time harvesting of maize and rice takes place and people are busy storing and preparing their farms again before the flooding season starts in late March. The flooding season keeps many people busy on the farms and the fish are in plenty.

The fishing methods during the flooding season are mainly traditional whereby the traditional facilities are placed at strategic points. Outsider fishermen use the nets for commercial fishing. Fishing in the flooding season is open access and nobody claims ownership but strategic points are identified and regular users are contacted for permission, if someone else wants to set up a trap at private fishing areas. Conflicts have been arising when local fishermen who have no right to set their traps at such points do not respect traditional points. Traditionally, such areas are inherited from father to son and the local fishermen are aware of them but sometimes-illegal use of such places occurs in the recession period. It can be concluded that the family members are responsible for taking care of these strategic fishing points, which have been founded by the grandfathers. The family members carefully approach such places and private offers are offered to the ancestral spirits, which the family believes, have control over the resource.

In the pre-independence times traditional methods were used for fishing in honour of the supper natural spirits, which were considered as gods of reproduction and production. Local people regulated fishing and collective fishing was organised around rituals. The ritual specialist was seen to control crocodiles and commercial fishermen had to submit themselves to local rules. If they do not do so it was believed that the controller of the lake had power to send crocodiles and hippos to chase the fishers off the lake and only after giving an offer can the fishers conduct their activities without harassment. These beliefs were known among the local communities and immigrants was not that strong to challenge it but were bound to respect the norms and cultural beliefs of the host lineage. Today things have changed and such norms and resource taboos are no more recognised by the locals and the outsiders. The breakdown of the pre-independence institutions governing the CPR contributed to an increase in conflicts regarding access and ownership of the resource locally.

Collective management was the main concept of each fishing lineage and the elders had power to administer the conservation and the distribution of the benefits through the local rules. These functions and institutions have been replaced by new state institutions, which have reduced the powers of the elders and replaced them with government officers, who are said to have

contributed to mismanagement of this communal resource. The fishing activities were collectively arranged and the lineage members had easy access and the resource was plenty compared to the current situation.

The improvement of technology in fishing has contributed to the change in resource use and access in the floodplain. The socio-economic importance of the resource has attracted many stakeholders at the local and regional level. The high demand for the resource contributing to the change in relative prices and the bargaining power at the local level has affected the management of the resource. The institutional change with new rules and regulations has sidelined the council of elders who used to administer the management of the fishing activities in the community lakes. The new state institutions with weak monitoring and sanctioning machinery has contributed to the diminishing of resource quantity in the Rufiji floodplain lakes. Today there is high competition between the locals and the newcomers with a rational, profit-oriented approach accompanied by destructive implements such as nets of less mesh size than one inch. The newcomers have a bargaining power and have taken control of the resource because of the fishing licences, which gives them power to access the lakes. The traditional exclusion rules have been eroded and the villager has to compete for their survival. The newcomers who are financially stable have employed the young village fishermen to do the job for them. These newcomers have the means to transport the resource to distant markets where fish prices are higher in comparison to local prices.

The fishing sector is currently dominated and controlled by the young fishermen who are less informed of traditional norms, which were applied in the pre-independence time for the conservation and regulation of the resource. Traditional religion stressed on the wise use of the natural resource and warned resource users on how the supper natural spirit responsible for production would curse and bring misfortunes to their families if proper use of the resources was not applied. The increase of young men in the fishing sector pressured by economic constraints has contributed to over fishing. The decline in fish stocks in the floodplain lakes is not good news for the local and migrant fishermen today. The low supply is not compatible with the high demand leading to over exploitation of the resource. The long periods of drought and unpredictable rains in the floodplain have not only affected the agricultural sector but also contributed to the decline of fish stocks in the floodplain lakes.

Interestingly local people have the view that fishing too much is not a problem today but fishing without respecting spirits leads to a decline in availability of fish. This reflects the traditional believes that it is the spirits and the major spirits Subiani that controls the fish and exposes people to wild animal attacks and keep the fish in the holes because respect is not shown. Therefore the idea to overuse fish is not known to local Rufiji groups.

### ***Hunting and institutional change***

Rufiji's hunting industry has gone through diverse social, economic, political and cultural epochs. The history and evolution of the industry, therefore, has been shaped by a number of transformations. These developed at various paces depending on a number of factors. In their varying degrees of development, the transformations have shaped the main framework regulating the country's hunting industry today. An analysis of the various epochs through which the hunting industry of Rufiji can be traced would now be undertaken. This exploration would shed light on some of the salient features in the historical development of the hunting industry.

Most society members who were predominantly hunters during the pre-independence era in Rufiji maintained cultures, traditions and taboos that contained hidden features which to some

extent ensured a close relationship between humankind and wildlife. There were established mechanisms to punish those who violated the revered rules.

The historical accounts of most of the hunting community members' practices during the pre-independence era ensured conservation of wildlife resources through cultural and social bonds. The historical records indicate that in some communities, sacred beliefs and fictions centred on certain species of wild animals. This ensured that conservation principles became enshrined in the culture. It has been noted that these beliefs have proved to be well-tested axioms for transmitting conservation ethics and knowledge from one generation to another.

Hunting was considered an important social function by most of the pre-independence societies of Rufiji. Subsistence hunting in some of these communities was a skill and profession in which gradations were locally organised. Selection and avoidance of certain species of wild animals was also common among such community members. In some communities it was the lineage elders who managed and controlled the number of hunts in each generation. The business of conducting ethnic hunts and ceremonies was usually confined to local leaders and the Mpindo.

In most communities, every member was in one way or another involved in the hunting processes. Due to the prevailing socio-economic conditions and relations of production being at a rather embryonic stage, the "hunting industry" in the pre-independence era in Rufiji could be located, albeit remotely, within the framework of a communal-based activity. The activity was founded on traditional rituals, rites and norms and structured in a way that ensured a tranquil co-existence between wild animals and community members.

The pre-independence format of the state and law of most communities that practised hunting was structured in a way that gave enormous powers to the enforcement machinery of the Mpindo and local clan leaders. The "industry" was regulated by prescribed hunting norms that sought to control the number of species of wild animals killed in hunts. Most of the norms provided for both community needs as well as conservation. The rules were well known, fair, properly enforced and relatively effective in the prevention of over-exploitation of wild animals in the pre-independence period.

The genesis of the hunting industry in Rufiji has also usually been traced to the early hunting initiatives commenced as a result of expeditions by Arabs from Zanzibar into the interior of East Africa in search of slaves and ivory. The early part of the second half of the 19th century witnessed the emergence of British safari expeditions and hunting was part of the expedition. These are also often made reference to while locating the history of region's hunting industry.

One very peculiar feature of most existing historical accounts on hunting in Rufiji is the failure or omission to acknowledge the fact that different historical and social epochs relating to hunting played a significant role in shaping the country's hunting industry. The history also fails to point out the changes in the industry that have been influenced by diverse cultural, social and economic conditions.

The contribution of pre-independence hunting community members in shaping and moulding Rufiji's hunting industry has not been given coverage. In view of its immense contribution to the development of the hunting industry today, these folks should not be left at the periphery in discussing the history of the industry in a country that boasts of a particular scenic splendour comprising of a true wilderness of unique wild animal species.

The local community's culture and traditions reflect various tenets that regulated and governed hunting. Clans and tribes in different parts of Tanzania, for example, had well known and revered rules relating to hunts. Some community members observed certain rites, rituals and taboos that ensured that wild animal species were not depleted during hunts. Accordingly, in some of these communities, it was only chiefs and heads of clans who were allowed to hunt or

authorise hunting. These authorities were required to abide by certain rituals and procedures pertaining to hunts. In some cases, they had to perform traditional pre-hunting sacrifices and rituals to seek the blessings of ancestors and wild animal gods before embarking on hunts or allowing parties to proceed with hunts.

Hunting seasons were common in most societies in this era and some species of animals, usually considered sacred or of totemic significance, were not to be hunted. Where they had to be hunted, very strict procedures, rules and rituals were to be adhered to. Most communities believed that some bad omen would befall hunters if the norms were not properly followed. Furthermore, most community members maintained hunting practices and rules that ensured their continued existence with wild animals. The rules were aimed at regulating and governing social behaviour in hunting and were enforced by recognised traditional institutional structures. These structures formed the foundation upon which the country's hunting industry is based. This foundation, however, crumbled with the arrival of foreign influence and culture.

Prior to the arrival of the British colonial regime, Arab traders had ventured into the interior of Tanzania and exercised direct and indirect authority over some local hunting tribes. These traders sized large amounts of ivory and other wild animal products and transported them to the coast. The expansion of this trade fundamentally altered the main tenets of the pre-independence "hunting industry" as some local hunting community members, who had hitherto abided by traditional rituals that prohibited killing game, started hunting wild animals with the specific objective of supplying the market. The hunting industry was slowly transformed from one that sustained the cultural and social fabric of local hunting community members to one that obeyed a capitalist market-oriented economy. These features became more and more pronounced during colonial rule and eventually fully blown towards the end of the colonial era. The colonial governments introduced new laws to protect the game, which was killed at a high rate by then. The new rules forbid the locals to engage in hunting without a permit. The post-colonial government adopted the colonial laws. However, despite the laws in place, the animals continue to decline in the area. The locals find that the new state institutions governing the management of the wild animals are worse than the coloniser's laws. The locals are totally excluded from the management of the game; however, the wildlife policies have been changed. The central government continues to control the resource as the demand for this resource increased at the local level.

Access to game is now made difficult for the locals as the laws forbid them to enter the Game Reserve or to hunt in their community forests. Obtaining a licence is not easy and it involves a lot of procedure. This document must be collected at Utete, the district headquarter, some hundreds of kilometres from the "twinned" village for this study. The villagers prefer to take a risk instead of undergoing all the process, which costs them to what they achieve from the game.

### ***Successful and unsuccessful collective action cases***

In spite of the two twin-villages being in the same floodplain, there are differences in CPR management due to differences in location and exposure to external influences.

#### ***Lake Uba (Mbunju/Mvuleni)***

Lake Uba is located in Mbunju/Mvuleni village, Mkongo division in Rufiji district. The village being close to the Ikwiriri Township has attracted more external fishermen to Lake Uba. Therefore, many different people with different interests try to use the fisheries in the lake and this has made the management of the resource complicated. It is difficult for local people to exclude the outsiders, because they have the access rights through fishing licences issued by the



fishery department. The possession of the licences gives the commercial fishermen the right and power to access the fish. Nobody can stop them as long as the permission paper is in their hands. The continued increase of fishing boats and nets in Lake Uba has contributed to competition between resident fishermen and seasonal commercial fishermen immigrating from Ikwiriri and the neighbouring villages. This is contributing to over-fishing in the lake. In addition, the changing of fishing technology has led to depletion and degradation of fish because of the use of small-meshed nets. Fishermen have reduced the mesh size of the fishing nets because big fish has become rare. The differences in interests between local villagers where one part of the people use fish for subsistence while young men co-operate with traders and external fishermen or sell fish by themselves, complicate the task of managing the fisheries. The joining of locals in the commercial business has increased the demand for fish and conflicts in Lake Uba.

In the last years the lake has been frequented with too many commercial fishermen and the fish stocks gradually started declining. It is said that the residents of Mbunju/Mvuleni pursued to close the lake with the help of the district authority and one of the external NGOs but the initiative has been challenged locally. However, the residents were concerned that the fish stocks were getting smaller and smaller, that didn't mean much to them when conservation decisions were about to be take.

The first attempt was taken when, a group of residents discussed the closing issue with the village council and then called a meeting of all residents in order to present the case for closing and reach community consensus on the project. The village government attended this meeting and presented residents with the relevant information. At the meeting, the residents agreed with the suggestions of the initiative group and the village government but were afraid how the implementation process was to take place. The residents apart from the group, which stated the project opposed further the agenda of the group and threatened to use other means to bring down their efforts to close the lake. The villagers found it abnormal to close the lake without consulting widely. The leaders tried to explain them the positive impact of closing the lake for a period but the whole issue turned to be politics. This explanation did not help to convince some residents that the decision against closing the lake was not particularly dangerous. The ideas of the leaders did not go down well as some individuals who accused them of corruption questioned the role in the project. It was openly questioned the interest of the external actors, which the locals claimed to have bought the lake from the village government and now were using tricks to convince the villagers that the closing of the lake was for the welfare of the local people.

According to one interviewee, the lake "was messed up years ago" and confusion emerged concerning multiple ownership of the Lake Resources and Lake Access. Initiative leaders ostensibly are working with the local government to resolve these issues, but uncooperative or unresponsive officials have slowed their efforts. Low community interest also has brought the attempt to a near standstill. Though many residents say they want a higher production, attendance at organisational meetings has been poor and people have been unwilling commit themselves to the project. One interviewee repeatedly emphasised that the process has been a "struggle" and that community interest declined particularly near the end of 2002 as the locals realised that not all interested parties in the lake resource were included in the discussions and the implementation of the project.

The members from the large ethnic group were pushing for the project implementation and at this point the minorities groups felt threatened and excluded from the management initiative. However, the leaders wanted to set up an institution that would bring together all the interested village residents to the project but the ethnic identity dominated the whole issue and the

initiative faced stiff challenges and was watered down before the implementation process started.

Though the issue was referred to the village committee for further study, following the meeting, general consensus was against closing the lake. Residents were wary of the costs for closing the lake but the explanations given from the village leaders were brushed aside as the resident villagers especially the young people stood on their decision. As the lake is the source of food and cash for many of the residents in this village closing it without giving them livelihood alternatives was seen as the major reason why the initiative was opposed. The villagers accused the village government of selling the Village Lake to the outsiders (NGO) and the district authority officials. Many people were not interested in committing any resources to the project as they complained on lack of co-operation and communication among the villagers and the leaders. One interviewee attributed community disinterest to “old school of thinking” residents who resist any kind of change, even though in his opinion the community would be better off with a new process of managing the lake. However, the external actors continued to push the village leaders to co-operate but the implementation process was difficult as the rest of the residents continued accessing the lake as before. Despite, the efforts of the external actor and huge sums of financial resources invested to protect the lake resource from over exploitation the initiators dreams died and buried after the external actor pulled out from the region before proper institutions were put in place to monitor and regulate entry. It was revealed that collective action in this case was difficult as the local people failed to have mutual interest in the resource and that kept away the interested groups from uniting to tackle the problem collectively for the seek of the resource and their personal interest. Trying to communicate with other lake users for the purpose of co-ordinating collective action seemed frustrating, even pointless, as the village residents were not sure with whom they should talk as the influx of resource users was uncontrollable. At this point the residents simply assumed that their individual contribution would not matter greatly to a management initiative. Per the expectations of van Dijk and colleagues (1998), social uncertainty inhibits collective action. While Allison and Kerr (1994) argue that community institutions can be strong mechanisms for promoting collective action, their efficacy depends in part on community perception that they are influential.

Generally this lake of Uba is used by a greater number of people today residents and non-residents than other surveyed lakes in the floodplain. The village residents sometime are unsure who actually comprises the village residents and thus who accounts for the management of the lake resource. As (Ostrom 1998, Bromley 1992, Simmons and Schwatz-Shea 1993) argue that the social networks, norms of reciprocity, and community cohesion that support co-operation only evolve over time among people who jointly depend on a resource.

However, when many different people use a resource and community members do not often see familiar faces when harvesting the resource, forming such bonds may be difficult. Also, unless legally adapted and strong on resources, institutions such as lake conservation may find it difficult to impose community preferences for lake use on the general public and monitor for violation. Even if these rules are legal and state-sanctioned, government enforcement may be weak (e.g., the experience of Lake Uba). It was witnessed that the large size of the community reduce the importance of social factors such as reputation and credible commitment; backing out of verbal commitments to support community initiated project such as lake closing for better production on the benefit of the interested resource users. Once the social cohesion fails it contributes to social barriers because residents do not know one another well or interact with one another often or long enough to establish an Institution for the management of the resource.

On one hand, CPR literature certainly argues that institutions are important to effective resource management. However, CPR writers also suggest that the role of institutions in collective action cannot be simplified in the manner of a relatively uncomplicated variable such as group size. Institutions vary significantly in composition, behaviour, purpose, and social standing; as Dietz and colleagues (2002, 25) point out, “the best available knowledge strongly suggests that the search for a single best (institutional) strategy will be futile.”

Theoretically, institutions facilitate co-operative CPR management as they provide the community with institutional memory, preserving the lessons of past collective action attempts and can foster trust and reputation (Schlager 2002, Seabright 1993, Simmons and Schwartz-Shea 1993, Ostrom 1990, Ostrom and Crawford 1995). As institutions are the tangible focus of group identification, the symbolic representation of the community to which members commit, it is necessary to support their formation to provide rules, which will control the behaviour of the resource users in order to avoid the tragedy of the open access.

Yet institutional structures and even their apparent advantages can hinder co-operation in certain scenarios. If, in the past, a community failed at collective action, institutional memory that reminds residents of this failure may reduce their confidence in the group’s future efficacy and make people unwilling to join a losing team like the case of Lake Uba. If the institution which is the locus of group sensibility loses public esteem, perhaps through poor leadership or inefficacy, the whole community’s sense of pride and common purpose may decline. Snidal (1984) argues that any history of interaction between group members impedes co-operation because of the damage to community trust and cohesiveness inflicted by the many small failures and betrayals inevitable in community life. By this logic, institutions, because they foster iterated interaction, always impede co-operation.

To conclude the Mbunju/Mvuleni residents failed to come up with an institution accepted by all interested actors in the use and management of the resource. The external pressure on the CPR in this village is high compared to Mtanza/Msona, which is far from the market centre. The heterogeneity of the resource users, community members, diversity of the interested groups, ethnic identity, political pluralism, made the whole system complicated. It is impossible to set up an institution in Mbunju/Mvuleni to manage the CPR because the internal competition overcomes the collective interest. The locals are not able to exclude the non-residents as many of them are said to have joint business with outsiders. Also the continued out and influx of the resource users, and time of resident in the village have contributed to difficulties to organise and co-ordinate at the village level as information flow takes time due to poor means of communication structured.

### ***Lake Mtanza (Mtanza/Msona)***

Lake Mtanza is located in the Western floodplain in Mloka division, Mtanza/Msona village in Rufiji district. The lake is surrounded by natural forest and is considered as a community lake and the only source of vegetables for Mtanza/Msona village residents. The lake is one kilometre from the village centre. The natural forest separates the village from the lake. To access the Lake the villagers have to walk through the sparsely distributed forest, which the villagers are allowed to harvest for firewood and building Materials. The issue of collective action rise when the villagers realised that the fish stocks in the lake were declining at a rapid rate, as the villagers favourite commonly consumed fisheries were not coming from the waters any more. It is said that the village residents got worried and started consulting to find a way to solve the problem.

The village being in a semi-arid region the residents hardly grow green vegetables in the gardens but wild vegetables can be collected in the forest during the wet season between March and June. The only possibility for the residents to feed on is through the lake resource. For the villagers this lake of Mtanza is their mother and father. The residents could not imagine surviving without fish. Every meal is accompanied with fish and their children have grown in the same way like their parents through the consumption of fish. All the households in this village are dependent on the fisheries from the lake either directly or indirectly, however, younger boys today are extending their fishing activities to the lakes of Selous Game Reserves but Lake Mtanza provides the villagers with protein security throughout the year.

As already mentioned early the climatic conditions and cultural beliefs will not allow the villagers of Mtanza/Msona to rear livestock as an alternative source for protein supply. The villagers fear for their security, as the livestock would attract wild animals such as leopards, lions to come closer to the village and that will endanger their lives but history of the residents disqualify them to own livestock, which the traditional culture is against.

Before the government transferred a large part of the village land to the Selous Game reserve the residents used to practise rotation of resource use and that enabled the resources to rejuvenate naturally. The declaring of the Game reserve illegal place for the residents from this village to access the resources forced the residents to concentrate on the limited resources, which were left open for them by the state. The residents managed to remain with Lake Mtanza as the rest of the lakes formerly recognised as community property were now under the management of the Selous Game authority. The nationalisation of these lakes caused great impacts on the fisheries in Lake Mtanza through over fishing.

Since the options of the villagers were now limited the dependence on this single lake for fisheries became high and competitive among the resource users. The villagers were sent into confusion and the locally established institutions were weakened by the state policies and everybody started fishing without following the traditional rules. These rules formerly promoted collective action in the region as the locals utilised the resource according to the demands of their super natural spirits, which had upper arm in the resource control and regulation. The respect of the spirits rewarded the locals and over fishing was not an issue before. Today the increasing of fish shortage has forced the local people in this village to come together to revamp the old traditional methods to curb the decline of the fisheries in the lake.

The revitalisation of the traditional system (misakasaka) brush park started in 2000, when a group of village residents discussed the problem facing the lake resource openly and thereafter invited the village government to share the ideas. The main goal was how the lake resource can be saved for the benefit of the locals and the future generation. The village council then called a meeting of all residents in this village to inform them the idea of conserving part of the lake for breeding reasons. This small group, which proposed the closer of the lake, did the analysis of the problem, which received less opposition, as the villagers appeared to share the same notion. In this case the size of the community favoured a collective action situation and that significantly lead to the success of the proposed initiative. This conquers with Olson's argument on utility incentives, which declines as group size increases because resource requirements for material incentives grow onerous and the power of peer approval diminishes with reduced member familiarity (Olson 1982, Gachter and Fehr 1999).

Moreover, as group size increases, transaction costs, psychological, and time expenses involved in communicating with group members, arranging meetings at which everyone can share information, make commitments, and reassure one another, and monitoring and reminding people of their commitments increase (Ostrom 1992, Olson 1982, Runge 1984, Snidal 1984). Though large groups seem to have few advantages in collective action scenarios, some

minimum group size seems necessary. Small groups, wherein resource demands can be spread only among a few, may be unable to bear the costs of relatively expensive co-operative endeavours (McCarthy, Sadoulet and de Janvry 2001).

Though Olson contends that homogeneous groups are advantaged in collective action scenarios in some ways, homogeneity of resources at a low level also may make collective action financially impossible. As group size increases, resource heterogeneity typically increases and brings with it greater potential for the emergence of resource-privileged actors (Bendor and Mookherjee 1987). Similarly, small groups have a small pool of potential collective action leaders; as size increases, so does the number of potential political entrepreneurs (Schneider and Teske 1992).

Though the members of small groups often know one another well and social cohesion arguably enhances collective action capacity, this solidarity has a downside. The familiarity among group members may reduce the need for social acceptance and the pull of conformity, freeing members to voice their opinions about the nature, strategy, or advisability of collective action and perhaps stalling a co-operative effort (Gruenfeld et al. 1996). Though small groups are advantaged by ease of communication and ability to rely on reciprocity and social norms to induce co-operation, these interpersonal arrangements are more sensitive and value-laden than the instrumental incentive strategies typically employed in larger groups. Reputation is a powerful force in norm-based co-operation schemes.

Two interviewees familiar with the lake of Mtanza provided testimony that the size of the lake and local co-operation has discouraged non-resident users to access the lake. Although through personal observation and oral information from the key informants the geographical position of the area that locks out potential non-resident resource users as access to the lake directly is complicated. The accessibility of this village is quit difficult, as the earth roads are not passable in the wet season when the fish stocks are high due to increase of floods. The catches are low in the dry season compared in the rain season when the lake is replenished with fisheries out-migrating from the neighbouring lakes in the Selous Game reserve.

The resident's unity and willingness to take active participation in the conservation and management of this lake has promoted local co-operation as the initiative was locally established. Wade (1988), Ostrom (1990), Baland and Platteau (1996) and Agrawal (2002), say that the most successful institutions have locally-designed rules because these structures best-fit community needs.

CPR users may want to co-ordinate but often have serious disagreements about the best way of their collective efforts (Hackett, Schlager and Walker 1994, Morrow 1994). This can be the case where the resource stocks do not meet the demands of the users leading to competition. The residents of Mtanza/Msona have managed to curb the fisheries problem through the application of the length of time a resident spends living in the village to be allowed to access the lake seems to affect the regulation outcome positively. Wade (1988) and Baland and Platteau (1996) operationalise this relationship as the overlap between resource location and the community's residential location (Agrawal 2002). Bromley (1992) and Oakerson (1986) include measures of residence regularity in their CPR management frameworks, and Ostrom (1990) argues that small residential groups that live near and depend on CPRs often successfully organise for collective management. Practically, the issue is whether the lake community mainly consists of year-round residents who work and carry on daily life in the area, or whether a significant portion of property owners are visitors who only spend fishing season at the lake like the case of Lake Uba.

From Olson's (1965, 1982) perspective, a community with low in and out-flux offers more opportunities for potential privileged actors to meet, realise they share a common compelling

interest, and mobilise jointly as co-ordination also are more likely to take place. On the other hand, part-time residents engage with the lake community within a specific time span. For some perhaps substantial part of the year, they have no say in decisions affecting future lake conditions as their interest is economic oriented. Even if residents intend to return to the lake next season, their threshold for interest in it has an upper limit; it is rational for an individual to invest little, materially or psychologically, in a situation over which he exerts little control. These argument roots the Prisoner's dilemma can be averted only, if participants perceive their engagements as potentially limitless and do not overly discount the future.

In this study, the regularity of residence has enabled the residents of Mtanza/Msona to organise and co-ordinate and this has Lake Management influence, because communication in the village is relatively easy, as the residents know each other personally. This has allowed the residents to anticipate the behaviours of others and co-ordinate their behaviours accordingly. The residents said the existing mutual relationship in the village is the best tool, which allows the residents to circulate information about the needs for the lake management and other issues related to natural resource management. The openness in communication at the local level has attracted more participants in Lake Management who are more likely to co-operate to achieve the highest optimal management solution in the near future.

Today the residents of Mtanza/Msona have vowed to control their resource choice and defend their resource from non-residents as well as resident defaulters at any cost. Now the local people regulate the fishing and collective fishing is organised around rituals. The ritual specialist is seen to control crocodiles and commercial fishermen have to submit themselves to local rules. If they do not do so, it is still believed that the super natural spirit the controller of the lake sends crocodiles and hippos to chase the fishermen out of the lake and only after giving an offer can the fishermen conduct their activities without harassment. Interestingly, local people have the view that fishing too much is not a problem but fishing without respecting spirits leads to a decline in availability of fish. This reflects the traditional belief that it is the spirits, and the major spirit Subiani, that control the fish and expose people to wild animal attacks and keep the fish in the holes because respect is not shown. Therefore, the idea of overusing fish is not known to local Rufiji groups.

While people from Mtanza-Msona act collectively in order to protect their fishing areas, the same is difficult for them when it comes to wildlife issues: The area is now easily accessible for poachers from Kisarawe district, which is the outlet route for bush meat to Dar es Salaam.

Game has become more and more open access resource because the Selous Game Reserve is not well monitored anymore. Due to SAP there are financial cuts in wildlife management. Scouts are not or not well paid and therefore monitoring of the reserve and sanctioning of illegal hunting is getting difficult. On the other hand, wildlife sells well in Dar es Salaam and a lot of commercial poachers are civil servants who lost their jobs through the SAP and the following civil servants reforms. They are now engaging in hunting as an income alternative. New Infrastructure and new technology have also led to better access to wildlife resources by roads and using new automatic guns and electronic positioning systems instruments (GPS) to track down the animals and escape the game scouts easily or pay the game scouts off. In addition, animals seem to move out of the area for two reasons: One is connected to the increased poaching, the other to climatic change: Because of less rainfall, less pastures for wild animals are available. This leads again to problems with agriculturists because wild animals start feeding on the fields.

To conclude the positive results after the revitalisation of the old methods of resource conservation and techniques of fishing has pulled more residents to the management team and now the villagers consider the resource as their own as rules of access are followed as

traditional beliefs reinforces them. The traditional rituals regulate the fishing in the lake today as it was in the pre-independence time. The local elders do participant in the management and have taken control of young boys who in the last ten years were accessing the lake as they wished. The empowerment of the local leaders is a positive sign of collective action as the rules of management are now implemented locally. The residents do make patrols a round the lake willingly in shifts and today free-riding in the lake of Mtanza has been reduced drastically said the village elder. The success of collective action is related to the common interest, which the villagers developed after the fisheries stocks started declining. After suffering the villagers realised their mistakes and the only way to correct them was through collective action. However, the villagers of Mtanza/Msona have managed to solve the problem of fisheries through collective action the wildlife conservation continue to be a problem in this village. The external pressure for this resource is high, as the markets are closer to the source. The villagers are attempted to co-operate with the external resource users for a living. Some residents depend on the wildlife, as a source of income and that is why many of the villagers are not ready to defend this resource. The animal-human conflict is another factor why the residents continue exploiting this resource because the government does not protect the villagers but the animals. Those who have joined the collective action group make verbal promises to one another about future behaviour and, if these pledges will be kept, the trust-based social foundation for future co-operation is established promoting the sustainability of the fisheries resource. The Collective action on fisheries has succeeded in this remote village as residents feel included and recognised in the entire management and that has promoted its successes.

### ***Conclusion and recommendation***

-Since the rural people live nearer to the natural resources, ample opportunities to use the resources are needed for the sustainability of the resources. But once the local people have lost secure property rights in the resources to external users, they also lose any incentives to protect the resource as they did in the past. The secure property rights in the resource enabled the local people to manage the resources for maximum long-term benefit compared to short-term benefits related to the seasonal resource users. It was noted once that the locals have lost property rights and the only alternative left for them is to compete with each other and new users and claimants in a race to extract as much short-term benefit from the resource as possible.

-The natural resources in the rural areas can only be sustained if the communities surrounding targeted areas for conservation are actively involved and committed in the process from the initial stage. Prior to any step taken in the conservation, the social-cultural values of the resource to the rural communities must be understood. The traditional knowledge of the rural people has to be recognised and respected well so as to be incorporated in the management of all natural resource e.g. fisheries, wildlife, forest, pasture and land

-The rural communities can manage their natural resources within their land given the enabling environment (legislation, policy and trust and training). Since these resources have been essential for local livelihood, security and survival of these communities for centuries, the management of them by external institutions without their involvement will affect their lives.

-The transfer of property rights from traditional user groups to centralised institutions eliminates incentives for monitoring and restrained use converts owner-protectors into poachers and thus exacerbates the resource depletion it was intended to prevent. There are cases where such transfers have been made and the resources eventually affected due to high competition among the resource user. India and Nepal offer the acute example but this is also a common

example in most of the sub-Saharan African countries where the independent governments transferred the natural resources from the community management to centralised institutions. The nationalisation of the resources has affected the livelihood strategies of the communities closer to the resources and now the sustainability of the resource is not guaranteed by the new institutions as it was in the past under the lineage institutions.

-There must be a functional management institution to offer the possibility of sustainable product flow and provide a more secure supply of resources to individuals locally. The common borders have to be protected, ensuring that outsiders have no access to communal resources, to allow the legalised communal members to continue benefiting from the resource. Where resources have little economic value to the local people because of the restrictive access rules from the state; sustainable local management institutions are likely to emerge.

-The management institutions have given incentives for conservation to local people and guarantee more access rights to the resources than before. The revitalisation of the traditional rights to the local people will give them incentives to protect the resource as the local people will continue to enjoy the harvesting of basic products such as firewood, poles, medicine, fruits etc.

-A centralised state policy that is not backed with enough resources to enforce its rule has led to a condition in which most resources in Tanzania are de facto open access resources.

-Insecurity of land and natural resources tenure explains the observed degradation or depletion of the CPRs in Rufiji floodplain. This is the case in Tanzania where the state owns land but the community members have the right to the products from the land they occupy without legally owning it (usufruct rights). Insecurity in tenure discourages local participation in resource management activities. This in turn increases the cost of monitoring and rule enforcement by the state.

-Understanding common property resources and the management regimes at the local level is important before attempts are made to conserve these resources, which rural people used to access through lineage membership ties for their livelihood before privatisation and liberalisation took place. The failure of recognition of the local people's rights by the Tanzanian government in natural resource management has led to lack of incentives to attract the villagers to protect the CPRs at the village level.

-The security of tenure needs to be established to enable the local communities to use the CPRs in a sustainable manner within their localities. The question of ownership in this respect is more important than access rights. This will help to determine whether the local people are willing to participate in the management and protection of the natural resources in their village land. The formalisation of resource tenure at the rural areas will enable the groups to monitor the resources exposed to them as the composition of resource users is considered to be one of the determining factors for sustainable resource management.

-It was observed that lack of clearly defined boundaries and the size of the resource would jeopardise the chances of effective monitoring. If the reserves are larger with long borders, then it requires many village scouts to monitor the resource effectively. The larger the reserves are the higher the costs of monitoring, as more human resources are needed to carry out the policing of the resource.

-The small size and remoteness of the place, type of resource, local culture, size of the group and locality determines the management and the cohesion of the local groups in the resource. It was observed that the proximity of the resource to the urban centres causes the demand to rise as the market value goes up, leading to overexploitation.

-The resources, which are easily accessible due to better infrastructure and communication, are likely to be over exploited as they attract more users with varying interests in the resources



unless there is proper organisation and co-ordination among the resource users leading to instability in the management.

-The local community members can respond collectively to a problem, despite the ethnic composition once they realise that only through co-operation will their interests be fulfilled. The socio-economic incentives promote collective action because of mutual interests in the resources created by the group members.

-However, the political regimes in Tanzania have been changing in the last three decades, the socialist Ujamaa policies continued to work as the villagers are still in the Ujamaa villages despite the fact that the socialist regime ended officially after the first President Nyerere left office. Despite the fact that the old system has been over taken by events, some groups of individuals with bargaining powers and political connections use the ideology of citizenship to allocate resources for themselves in the current period. These people exploit the local communities who seem to be ignorant of the new land Act of 1999, which states clearly the local people's participation in land and natural resource management.

-The transition in political regimes and changes in administration policies in the last two decades has created management vacuum at the local level as confusion in the management continued taking root. The system of administration does not reflect the local resource user rights. It was observed that the most powerful people are now moving to these rural regions, for resource exploitation under the protection of which had been considered as the most remote areas. The accessibility of an area is important to determine the sustainability of the resource. We expect fewer people to flock to an area, which is less accessible, as transaction costs will rise, discouraging the resource users from such an area. The distance of the resource from the urban areas might not play a role in its sustainability, but the accessibility of an area is important.

## References

Agarwal, A., and S.Goyal.(2001), Group size and collective action: Third party monitoring in common pool resources. *Comparative political studies* 34(1):63-93.

Agrawal, A., and E.Strom.(2001), Collective action, property rights, and decentralisation in resource use in India and Nepal. *Political and Society*.

Agrawal, Arun.(2002), Common Resources and Institutional Sustainability." In *The Drama of the Commons*, eds. Elinor Ostrom, Thomas Dietz, Nives Dolsak, Paul C. Stern, Susan Stonich, and Elke U. Weber, 41-85. Washington, D.C.: National Academy Press.

Allison, Scott T. and Norbert L. Kerr.(1994), Group Correspondence Biases and the Provision of Public Goods." *Journal of Personality and Social Psychology* 66: 688-698.

Baland, J., and J.Platteau.(1996), *Halting Degradation of Natural Resources: Is There a Role for Rural Communities?* Oxford, Eng.: Clarendon Press.

Bendor, Jonathan and Dilip Mookherjee.(1987), Institutional Structure and the Logic of Ongoing Collective Action." *The American Political Science Review* 81: 129-154.

Bromley, David.(1992), The Commons, Property, and Common-Property Regimes." In *Making the Commons Work*, eds. Daniel Bromley, David Feeny, Margaret A. McKean, Pauline Peters, Jere L. Gilles, Ronald J. Oakerson, C. Ford Runge and James T. Thomson, 3-16. San Francisco: Institute for Contemporary Studies.

Dietz, Thomas, Nives Dolsak, Elinor Ostrom and Paul C. Stern.(2002), The Drama of the Commons.” In *The Drama of the Commons*, eds. Elinor Ostrom, Thomas Dietz, Nives Dolsak, Paul C. Stern Susan Stonich, and Elke U. Weber, 3-35. Washington, D.C.: National Academy Press.

Ensminger, J.(1992), *Making a Market: The Institutional Transformation of an African Society*. Cambridge, Eng.: Cambridge University Press.

Ensminger, Jean. and Jack Knight.(1997), Changing Social Norms: Common Property, Bride wealth, and Clan Exogamy. *Current Anthropology*. 38(1): 1-24.

Gachter, Simon and Ernst Fehr.(1999), Collective Action as a Social Exchange.” *Journal of Economic Behaviour and Organization* 39: 341-369.

Greif, A.(1994a), Cultural beliefs and the organisation of Society: A historical and theoretical reflection on collectivist and individualist societies. *The Journal of Political Economy* 102(5): 912-950

Gruenfeld, Deborah, Elizabeth A. Mannix, Katherine Y. Williams and Margaret A. Neale.(1996), Group Composition and Decision Making: How Member Familiarity and Information Affect Process and Performance.” *Organizational Behaviour and Human Decision Processes* 67: 1-15.

Hackett, Steven, Edella Schlager and James Walker.(1994), The Role of Communication in Resolving Commons Dilemmas: Experimental Evidence with Heterogenous Appropriators.” *Journal of Environmental Economics and Management* 27: 99-126.

Hardin, Garrett. (1968), The Tragedy of the Commons.” *Science* 162: 1243-1248.

McCarthy, Nancy, Elisabeth Sadoulet, and Alain de Janvry.(1998), Endogenous Provision and Appropriation in the Commons.” *American Journal of Agricultural Economics* 80: 658-675.

McCarthy, Nancy, Elisabeth Sadoulet, and Alain de Janvry.(2001), Common Pool Resource Appropriation Under Costly Co-operation.” *Journal of Environmental Economics and Management* 42: 297-309.

North, D.C.(1990), *Institutions, Institutional Change and Economic Performance*. Cambridge, Eng.: Cambridge University Press.

Oakerson, Ronald.(1986), A Model for the Analysis of Common Property Problems.” In *Common Property Resource Management*, Proceedings of the Conference held in Washington, D.C. 21-26 April 1985, prepared by the Panel on Common Property Resource Management, Board on Science and Technology for International Development, Office of International Affairs, National Research Council, 13-31. Washington, D.C

Olson Mancur.(1965), *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge, MA: Harvard University Press.

Olson Mancur.(1982), *The Rise and Decline of Nations*. New Haven, CT: Yale University Press.

Ostrom E.(1990), *Governing the Commons: The Evolution of Institutions for collective actions*. Cambridge, Eng.: Cambridge University Press.

Ostrom E.(1998), A behavioural approach to the rational choice theory of collective action. *American political Science Review* 92(1):1-22

Ostrom, Elinor and Sue E. Crawford.(1995), A Grammar of Institutions.” *The American Political Science Review* 89: 582-600.

Runge, C. Ford.(1984), Institutions and the Free Rider: The Assurance Problem in Collective Action.” *The Journal of Politics* 46 (February): 154-181.

Schlager, Edella.(2002), Rationality, Co-operation, and Common Pool Resources." American Behavioural Scientist 45: 801-819.

Schneider, Mark and Paul Teske.(1992), Toward a Theory of the Political Entrepreneur: Evidence from Local Government." The American Political Science Review 86: 737-747.

Seabright, Paul.(1993), Managing Local Commons: Theoretical Issues in Incentive Design." The Journal of Economic Perspectives 7: 113-134.

Simmons, Randy and Peregrine SchwartzShea.(1993), Method, Metaphor, and Understanding: When is the Commons Not a Tragedy?" In The Political Economy of Customs and Culture, eds. Terry Anderson and Randy Simmons, 1-13. Lanham, Maryland: Rowman and Little field Publishers, Inc.

Snidal, Duncan. (1984), Co-ordination versus Prisoners' Dilemma: Implications for International Co-operation and Regimes." The American Political Science Review 79: 923-942.

Van Dijk, Eric, Henk Wilke, Marieke Wilke and Linda Metman.(1998), What Information Do We Use in Social Dilemmas? Environmental Uncertainty and the Employment of Co-ordination Rules." Journal of Experimental and Social Psychology 35: 109-135.

Wade, R.(1988), Village Republics: Economic Conditions for Collective Action in South India. San Francisco, Ca: ICS Press.