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COMMUNITY- BASED NATURAL RESOURCE MANAGEMENT INSTITUTIONS IN RUWANGWE WARD, NYANGA DISTRICT, ZIMBABWE: IMPLICATIONS FOR ENVIRONMENTAL SUSTAINABILITY

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Abstract

This research examined the effectiveness of community-based institutions in achieving sustainable natural resource management. Research was conducted in Ruwangwe Ward, Nyanga District, in Zimbabwe's Manicaland Province. A questionnaire survey and focus group discussions were used as complementary methods. Both the survey and focus group discussions indicated that rising population pressure on a diminishing land resource base was causing environmental degradation, resource depletion and resource scarcity in the ward. Research results also revealed intra-community, inter-community and community-state resource conflicts deriving partly from state interference in local level natural resource management and also from rising household and community level resource scarcity. Although research results showed the existence of community-based natural resource management institutions, these are largely weak and therefore ineffective. The major reasons being state intervention in local level natural resource management, unclear or non-existent institutional rules, and absence of monitoring and enforcement mechanisms. . For local level institutions to be effective, the state must ensure tenure security and confer complete proprietorship over natural resources. In addition, the state should define the legal framework that will empower community-based natural resource management institutions, clearly define property rights and involve communities in participatory planning. Furthermore, government needs to commit adequate financial and technical assistance to build rural resource managerial capacity. Such measures will help achieve sustainable community-based natural resource management.

Background to the Study

The management of natural resources under common property regimes in rural communities became the focus of research in the 1980s. In this article the researcher

takes Richards' (1997) interpretation of common property resources (CPR) as those resources with communal arrangements or rules that exclude or limit access to non-users and regulate use among co-owners. Although there is no single definition of a local community, some distinguishing elements include shared economic and social relations, or the transmission of knowledge, values and customs; and group membership based on locality (Gilg, 1985; Mudiwa, 2002). Renewed interest in management of CPR is due to the realization that the diverse range of products from such resources cannot be easily replaced and that rural households, particularly those in the South, continue to depend on such resources for survival (Arnold and Steward, 1991; Moyo and Tevera, 2000; Chikowore et al., 2002; Elliot, 2006). Resurgence in interest in traditional resource management systems also derives, firstly from the failure of many "top down" development projects in rural areas of less developed countries (LDCs), and secondly from the realization that the continued existence of natural resources in these areas is proof that traditional societies managed resources in a sustainable manner (Berkes, 1989; Rich, 1994; Adams, 2001; Chikowore et al., 2002).

The concept of resource management refers to decisions concerning policy or practice regarding how resources are allocated and the conditions or arrangements for the development of such resources. Resource management is influenced by technological levels, culture and the politics of the area, since these determine resource supply and accessibility. Therefore in this article resource management is used to mean decisions on the allocation, and sustainable use of natural resources. A sustainable condition is one that can be maintained indefinitely without progressive deterioration of the valued qualities of a resource (Munasinghe and Shearer, 1995). Sustainable resource

management depends on the existence and reinforcement of viable resource management institutions or the creation of such institutions where they do not exist. In the context of resource management, an institution is a set of accepted social norms and rules for making decisions about resource use. The norms and rules define who controls the resource, how conflicts are resolved, and how the resource is managed and exploited (Richards, 1997).

Most models of common property resource management derive from or are a reaction to Hardin's 'tragedy of the commons' thesis (Hardin, 1968). Hardin assumed that common property resources are open access and that such resources are doomed to over-exploitation, since resource users are individualistic and are unable to cooperate for the common good. His conclusion is that CPR must either be privatized or controlled by the state to ensure sustainable use. Critics of Hardin's 'tragedy of the commons' assert that unlike in open access situations where there are no relevant institutions controlling resource use, in common property situations both use rights and institutional controls exist (Ostrom, 1990; Chikowore et al, 2002).Ostrom rejects Hardin's prescription of privatization and instead proposes agreements by users. Such agreements can be enforced by such mechanisms as external government agencies, with the user community members as monitors. The 'tragedy of the commons' thesis has also been criticized for being ethnocentric, for emphasizing competition rather than co-operation and for assuming the supremacy of individualism over communitarianism (Berkes, 1989; Berkes and Ferver, 1989). Collective management of resources, however, is undermined by the low economic value of resources, differences in interest in the resource as a source of income and different resource use strategies. As economies move more towards integration, as in

the current globalization process, the scope for local collective action further declines since the authority of traditional leaders and local elites becomes increasingly eroded (Lawry, 1990; Chikowore et al., 2002).

In spite of their crucial contribution to the livelihood of the vast majority of rural people in the developing world, resources held under common property regimes are experiencing severe degradation. This is partly due to the decline or collapse of traditional resource management institutions (Jodha, 1991; Davis and Wali, 1993; McElwee, 1994).The weakening or demise of community-based natural resource management (CBNRM) practices has led to overexploitation of resources, resulting in degradation. Colonialism in most LDCs largely accounts for either the decline or demise of local level resource management institutions. The colonial experience meant that decisions on the management of local resources were increasingly made in distant bureaucratic institutions (Murombedzi, 1994). It has been argued that bureaucratic control, top-down land use planning and manipulation of tenure regimes, and not Hardin's 'tragedy of the commons', explain the decline of local level resource management institutions in developing countries (Murombedzi, 1994; Rich, 1994;Adams, 2001). Hardin's model, however, has influenced resource management in many developing nations. Large scale nationalization, privatization, and land distribution policies in areas with CPR in Asia and Latin America have been blamed for resource depletion and degradation, and ultimately for either the erosion or collapse of traditional management institutions (Jodha, 1991; Lynch and Alcorn, 1994). In Africa, the 'tragedy of the commons' model has also influenced resource management in that government policy has often been guided by the assumption that resources are best managed under

individual or state private property regimes. Consequently the state has imposed its control over resource management, a trend that is partly responsible for the decline or collapse of community-based resource management institutions (Cousins, 1992; Murombedzi, 1994; Singh; 2000). Another problem facing local level resource management in Africa is the inability of traditional institutions to exclude non-group members, due to the large group sizes of resource users. Therefore resource management becomes ineffective and unsustainable.

Apart from the colonial experience, post-colonial state intervention through privatization and state control has equally negatively impacted community-based natural resource management institutions. This is in spite of the fact that most governments of the South have neither the financial nor the human resources and the institutional capacity to manage resources so acquired. In the majority of cases, state appropriation of resources has either weakened or destroyed traditional resource management institutions, alienated local people from resource management and engendered environmental degradation. While neither glorifying indigenous resource management institutions nor advocating a complete reversion to traditional resource management institutions, it is indisputable that the best managers of resources are the users of those resources themselves. The active participation of local communities in the management of their resources is therefore a prerequisite for sustainable resource management.

The failure of many top down rural development projects and persistent environmental degradation in many parts of the world has led to the questioning of the resource management strategies currently in use and a realization that environmental problems are localized and specific, and therefore require local responses (Richards,

1985; Agrawal and Gibson, 1999; Adams, 2001). There is, therefore, a need to support rather than replace local initiatives in resource management. It is also argued today that to effectively combat resource management problems, formal science should be combined with indigenous technical knowledge (ITK) (Brokensha et al., 1980; Huijsman and Savenije, 1991; Atte, 1994; Singh, 2000; Adams, 2001). ITK refers to local, folk repository of technical knowledge and management systems. The argument put forward is that local level resource management institutions in LDCs are not hampered by the ignorance and lack of interest of rural folk or lack of cooperation, but by the use of imported planning and resource management strategies. As a result, valuable local knowledge as well as the vast and tested experience of local communities in resource management is ignored. Although local people cannot and do not always provide solutions to local environmental problems, critical grassroots involvement in environmental management has been unduly neglected. Therefore there is widespread agreement that sustainable resource management can only be achieved through active community participation.

Murphree (1995), with reference to Southern Africa, sees the problem hindering sustainable community-based resource management as lack of tenure security by rural households. He therefore argues for a fundamental shift in national policy to effect secure tenure rights in rural communities. Several factors have been identified as necessary for sustainable community-based natural resource management. These include clearly defined boundaries for the resource areas and the resource user, benefits to users, and the involvement of resource users in modification of operational rules. In addition a definite monitoring system with clear-cut sanctions for violating resource use rules, and conflict

resolution mechanisms must exist (Ostrom, 1992). Governments should not challenge the rights of resource users to devise their own institutions. Lastly there is need for nested community organizations which will link community-based natural resource management initiatives with other community activities (ibid).

In Zimbabwe, like in many other African countries, state intervention has hindered sustainable natural resource management at the community level. Access to land and control of natural resources in both the colonial and post-colonial eras have been characterized by conflict between communities and the state. During the colonial period the subordination of traditional leadership to central government meant that its role in CPR management was reduced to tax collection and enforcement of centrally designed environmental laws. The post-colonial government decentralized local government in 1984 to allow communal people to participate in the development process through the creation of Ward Development Committees (WADCOs) and Village Development Committees (VIDCOs). However, the Rural District Councils Act of 1988 contradicts the idea of local community participation in the development process (Chikowore et al., 2002). The Act authorizes Rural District Councils (RDCs) as 'appropriate authorities' to control the utilization and management of natural resources in communal areas, and empowers RDCs to manage the utilization and conservation of natural resources in communal lands. Apart from the contradictions inherent in the Act, relationships between the state local government structures and traditional structures have continued to be conflict ridden. VIDCOs and WADCOs are perceived as replacing traditional authority, engendering conflict and competition; thereby reducing the effectiveness of community-

based natural resource management institutions, and seriously compromising sustainable local level natural resource management.

Community control of resources in Zimbabwe's communal lands is mainly related to grazing, forests or woodlands and water. Arable land on the one hand is subject to some degree of group control, but on the other hand is largely managed individually (Fortmann, 1992; Murombedzi, 1994; Mutepfa et al., 1998). Community-based management of woodlands and access to their products is quite problematic in Zimbabwe's communal areas. Land and tree tenure are often different and subject to conflict. While land may be individually controlled, the trees on it may continue to be under group management. Access to such trees is restricted during summer but after harvesting they become common property. Research on communal grazing in Zimbabwe has shown limited community control over grazing (Scoones and Wilson, 1989; Cousins, 1992; Scoones and Matose, 1992). Almost all communities in the communal areas have a rotational grazing management system where livestock is herded in summer and allowed to roam after harvest time. Absence of complete community control over natural resources in Zimbabwe's communal areas will continue to pose a challenge to sustainable community-based natural resource management.

It has been argued that in spite of limited local level control of other natural resources, sustainable community-based management of wildlife is being largely achieved in those of Zimbabwe's communal lands adjacent to either game or national parks (Murphree, 1996; Murombedzi, 1997). Such management is currently done in the context of the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE). The CAMPFIRE concept has its origins in 1978 when the Department of

National Parks and Wildlife Management (DNPWLM) introduced the Wildlife Industries New Development for All (WINDFALL). WINDFALL aimed to reduce human-wildlife conflict and improve attitudes towards conservation in affected communal areas by returning some of the benefits of conservation to communities living with wildlife. WINDFALL failed because it did not generate local-level participation in decision-making and a sense of local proprietorship, while benefits were too little and took to long to come (Murphree, 1990). That this initiative occurred at the height of the liberation struggle also meant that affected communities viewed central government linked activities with suspicion.

The CAMPFIRE document was drawn up by ecologists in the DNPWLM in 1984 and was adopted as a policy document in 1986. The CAMPFIRE policy was incorporated in the broad objectives of the National Conservation Strategy (Ministry of Natural Resources and Tourism, 1987). The major aim of CAMPFIRE is to devolve legal authority to district councils to act as appropriate authorities over wildlife, grazing, water and forestry resources in their areas of jurisdiction. Authority should further be decentralized to wards and villages while at the same time providing incentives for conservation. Such incentives will derive from the benefits of wildlife utilization, for instance, to those communities which suffer most from wildlife depredations. CAMPFIRE objectives include common ownership of natural resources with defined access rights and voluntary participation of producer communities, establishment of suitable management institutions with direct benefits to those communities, and the provision of technical and financial assistance (Martin, 1986).

The CAMPFIRE model, to date, has been applied in a limited sense, focusing just on wildlife management. Many districts have successfully implemented CAMPFIRE programmes, with some of the best examples being Beitbridge, Guruve, Hurungwe and Nyaminyami Districts (Murphree, 1996). In Beitbridge and Guruve, direct representation and participation, as well as direct benefits in the form of meat and revenue to households have proved a powerful motivating factor for conservation of wildlife. However, in those districts, like Nyaminyami, lacking grassroots participation in wildlife management and where benefits are more to wards than to individual households, poaching persists. CAMPFIRE has also enabled remote and marginalized communities to transform their land use practices. Such communities are no longer at the mercy of chronic crop failure in very marginal agro-ecological zones where development prospects were minimal. Community control of wildlife now presents these communities with real prospects for sustainable development. It has also been argued that CAMPFIRE has been successful because it has produced complementarily rather than competition and conflict (Murombedzi, 1997). In spite of the considerable success of the CAMPFIRE model, RDCs still retain power and lack commitment to devolve authority to the residents of communal areas.

Another challenge that will continue to face CBNRM in Zimbabwe is rising population pressure on a finite and shrinking resource base (Gore et al., 1992). Zimbabwe's rural population rose from 400 000 in 1890 to 1 125 000 by 1950, to 4.2 million by 1982, then increased further to 7.2 million by 1992 and went up to 8.38 by 2002 (Whitlow, 1988; Moyo et al., 1993; CSO, 1994; UNDP, 2004). Of the 8.38 million rural inhabitants, 6.12 million were in the communal lands with the remaining 2.26

million being commercial farm workers (computed from UNDP, 2004 and Mehretu and Mutambirwa, 2006). Literature on the communal lands reveals that by 1980 they had either reached or exceeded their carrying capacity (Cross, 1977; Stubbs, 1977; Whitlow, 1979; Moyo, 1993; Mehretu and Mutambirwa, 2006). The communal lands were supposed to support 280 000 households, but by 1977 they were home to 675 000 households or two and half times more households than recommended (Riddell, 1978). In spite of the highly controversial and contested "fast track" land reform programme, meant to decongest the communal areas and achieve greater equity in land ownership, the communal lands are still overpopulated, as they are now home to 2 000 000 households! (Rukuni et al., 2006). Rising population pressure has resulted in high rates of deforestation, encroachment of cultivation onto marginal and fragile land, and acute soil erosion.

Some of the challenges facing CBNRM have been discussed, but perhaps the greatest challenge that confronts common property resources today is the globalization process. The process of globalization dates back many centuries, but has gained more prominence due to the increasing integration of nation states through economic exchange, political configurations, unprecedented technological advances and pervasive cultural influences (Henriot, 2001). Globalization operates from above and therefore has structures and policies that are not always relevant to local communities. This means that any legal and institutional set-up regarding the administration and management of the commons must on the one hand be placed within an international context, but on the other hand protect the interests of local communities. The challenge facing countries of the South, like Zimbabwe, is that any policies they formulate to empower rural

communities must not contradict international rules as stipulated by such organizations as the World Trade Organization (WTO), and international agreements like the Convention on Biological Diversity (CDB) and the Convention on International Trade in Endangered Species (CITES).

Description of the Study Area

Research was conducted in Ruwangwe Ward, Nyanga District, Manicaland, Zimbabwe's eastern province. The district has all the five agro-ecological zones. Ruwangwe Ward is located in Katerere Communal Lands, 75km north of Nyanga Town. Research was carried out in three villages located in Ruwangwe Valley, which constitutes Ruwangwe Ward East. Altitude in the Valley varies from 760m in the Matize River to over 1360m in the Ruwangwe Range. Ruwangwe Ward is a semi-arid area in agro-ecological zone four. It is characterized by high temperatures and low rainfall ranging from 550mm during most years to 750mm per annum during good years (Ministry of Local Government, Rural and Urban Development, 1994). Ruwangwe Valley, like other areas in Region IV, is subject to periodic seasonal droughts and severe dry spells. Soils are mainly moderately leached, light to dark grey granitic sands. These granite derived sands are inherently infertile and therefore susceptible to erosion. Vegetation is dominated by a sub-climax of savanna woodlands that have been heavily denuded (Mazambani and Katerere, 1994). Villagers in the study area are largely dependent on rain-fed agriculture, with cattle and goat rearing as complementary livelihood activities. Local livelihoods are also closely tied to the availability of natural resources like wood, water and pasture. Vincent and Thomas (1960) recommended extensive livestock rearing

as the best land use in areas like Ruwangwe Ward which are located in regions 4 and 5. The three irrigation schemes in the area are very small scale household vegetable plots. Limitations imposed by low and erratic rainfall as well as inherently infertile soils do not only limit agricultural potential, but also threaten the very livelihood of the community. Effective community-based natural resource management institutions are therefore crucial to ensure sustainable livelihoods in the ward.

Research Methodology

The research sought to identify local level natural resource management institutions and assess their role in achieving sustainable resource management. Research was carried out in three villages in Ruwangwe Ward: Kwaedza, Musurudzi and Rugare. Researcher-based and participant-based aerial photo interpretation (API), a questionnaire survey and FGDs were used as complementary methods to investigate the existence and effectiveness of community-based resource management institutions. The researcher's own aerial photo interpretation and analysis were preceded by study of the Nyanga Master Plan and the Nyanga District Environmental Profile, as well as reading and interpretation of topographical maps for the area in order to establish general environmental trends within the study area. Two enlarged A5 prints each for the years 1972, 1986 and 1996 covering the three villages were purchased from the Surveyor General's Department. While the enlarged prints were initially used for a detailed API exercise under a mirror stereoscope, they were also used during the FGDs for participants to identify general spatial and temporal changes in the local environment.

The questionnaire survey was administered in three villages: Kwaedza, Musurudzi and Rugare, after being pre-tested in Munondo Village, a village outside but adjacent to Ruwangwe Ward. Household lists were obtained from the VIDCO secretaries through the local councilor. Sampling was done in two stages. Firstly three villages were purposively selected on the basis of their population. Secondly, a further sample was systematically selected from each village, with every other household in each village being sampled. Sixty-one out of 122 households in Kwaedza, 83 out of 166 households in Musurudzi and 66 out of 132 households in Rugare were selected. Altogether 210 out of a total of 420 households were interviewed with the help of two research assistants. The head of the household or his spouse was the respondent. Where both were absent, the most senior member of the household was interviewed, provided the respondent was not less than eighteen years old. With polygamous families if the husband was absent, the senior wife was interviewed, and if she too was absent the next wife in order of seniority was interviewed. This was done to avoid cluster sampling. With those households where there was no respondent eighteen or more years old, an appointment was made for another visit. The questionnaire measured villagers' awareness of negative environmental changes, their perception of the causes of these changes, as well as the villagers' views on the existence and effectiveness of community-based natural resource management institutions.

Five focus group discussion meetings were held: one in Kwaedza and two each in Musurudzi and Rugare. The FGDs were designed to obtain greater insight into the experiences and views of the villagers concerning natural resource management in the study area. Participants were preferably those who had resided in the area for at least

twenty years. Selection of the actual participants was done with the help of the village head and his secretary. Another requirement for the selection of the FGD participants was that they reflect as far as possible the spatial distribution of the population in each village. It was decided from the outset that the focus groups would be heterogeneous with regard to gender. Although it is assumed that traditionally in Africa's rural communities women are less vocal when men are present, several factors weighed against homogeneous groups. It would have taken double the time to hold meetings if groups were constituted by gender. Another consideration in favor of heterogeneous groups was that every group would have more females than males. This was to reflect the sex-structure of Ruwangwe's population which according to the 2002 census had 53% females and 47% males (CSO, 2004). Therefore the women would have greater chances of participation. A third factor was that since the topic was neither controversial nor sensitive, both men and women would be able to discuss freely. Another reason was that women in Ruwangwe Ward are actively involved in VIDCO committees and meetings. Finally, since the researcher was the moderator or facilitator during each FGD meeting, where the need arose, a deliberate attempt would be made to involve female participants. The group size averaged eight participants with an average of five women in each group. Meetings were held in a sheltered venue between 10:00am and 3:00pm. FGD guidelines with major topics, sub-topics, questions and probes were used, as well as the aerial photo enlargements. During each meeting one research assistant took notes while the other tape recorded the proceedings. A review session was held by the research team after each FGD.

Results and Discussion

The first stage of the analysis of the research results was to establish the nature of negative environmental changes and the resultant environmental degradation in Ruwangwe Ward. This was done through API, as well as through an analysis of both questionnaire survey and FGD results. Survey and FGD results were then examined to establish the causes of environmental deterioration.

API was used to establish general temporal and spatial environmental changes in natural vegetation cover and the area under cultivation in the ward between 1972 and 1996. The term 'natural vegetation cover' was used with a limited sense to refer mainly to tree cover. The area under cultivation doubled between 1972 and 1996. This rise was matched by a decline in vegetation cover in the area, although not in equal proportions. Focus group discussions indicated that some of the increase in cropland was due to re-cultivation of fallow land.

Changes in the area cultivated and in vegetation cover were most rapid between 1972 and 1986, a period that spans the later phase of the liberation war and the early years of independence. During the liberation struggle, central government found it increasingly difficult to enforce natural resource management regulations. FGDs showed that resource management regulations were viewed by the peasantry as oppressive, an indication of community-state conflict. Soon after independence, lack of a clear government policy on natural resources management negatively impacted on the environment. It also emerged from FGDs that there was considerable displacement of people from the Zimbabwe-Mozambique border into Ruwangwe Ward between 1980 and 1992 due to the destabilizing effects of the RENAMO war in Mozambique. These

findings confirm observations made by Mazambani and Katerere (1994). FGDs also attributed the population increase in the study area to movement of people from more remote areas of Nyanga North to access services like clinics and schools. It is, however, interesting to note that the growth in population was perceived largely in terms of in-migration and hardly as a result of natural increase. The reason could be cultural in that a large family is the norm in most communal areas of Zimbabwe.

Another dimension of the rise in cropland is that cultivation has increasingly extended towards ecologically fragile areas such as streambanks and hillslopes. Field observations revealed the absence of mechanical soil conservation measures on the ecologically fragile land. Both field observations and FGDs revealed that as soils become impoverished, cultivated areas are abandoned and revert to grazing while more land is bought under cultivation.

Survey results showed that the main temporal and spatial environmental changes in Ruwangwe Ward were related to vegetation destruction, impoverishment of soils, soil erosion and river siltation, a decline in the both the quantity and quality of grazing, as well as reduced storage capacity of rivers, boreholes and wells especially in the dry season (Table 1).

Table 1: Negative Environmental Changes – Perception by Villagers (%)

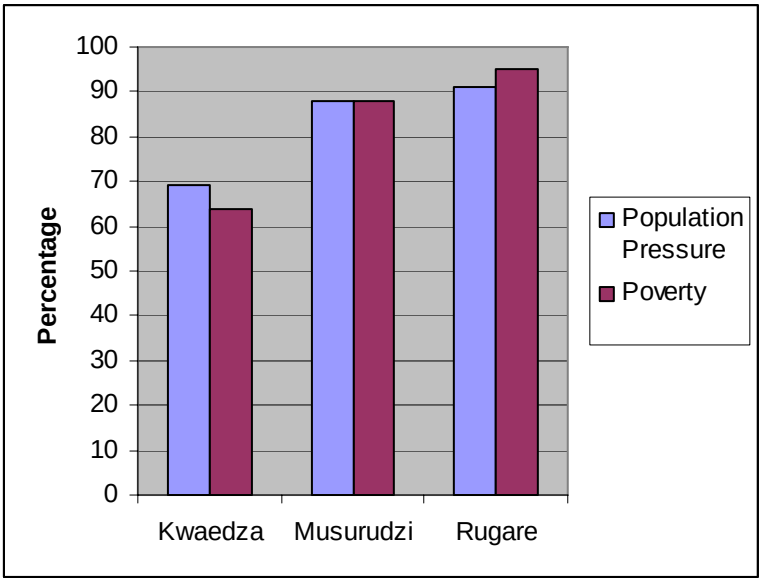
Village	Vegetation Destruction	Soil Erosion & Siltation	Soil Impoverish-ment	Declining Grazing Quantity & Quality	Reduced Water Storage Capacity
Kwaedza	77	74	87	72	87
Musurudzi	84	87	84	92	95
Rugare	76	95	95	77	95

FGDs, partly based on the enlarged 1972, 1986 and 1996 prints, confirm these findings. These environmental problems, as discussed earlier (Ministry of Natural Resources and Tourism, 1987; Whitlow, 1988; Gore et al., 1992; Moyo, 1993; Mehretu and Mutambirwa, 2006) are prevalent in communal lands located in the low potential and ecologically sensitive agro-ecological regions IV and V.

Most of the environmental problems that focus groups identified and discussed were, however, based on their own experiences and observations. One major problem that FGD participants discussed was reduced biodiversity, especially reduced tree species. The groups argued that this has led to less selectivity in the harvesting of tree products. Consequently some species of wild fruit trees like *Cussonia kirkia*, *Strychnos cocculoides* and *Tamarindus indica* are no longer conserved but felled for various uses. FGDs identified other changes as the complete extinction of a thatching grass species, *Hyperrenia filipendula,* and the disappearance of an aquatic ecosystem associated with reeds and perennial pools from the Musurudzi River. In addition FGDs identified and discussed reduced water storage capacity of rivers, wells and boreholes in the dry season, and an increase in streambank cultivation. Participants considered woodland, water, grazing and other resources in Ruwangwe Ward as increasingly inadequate both at household and community level, confirming research findings of a study conducted in Ward 2, north of Ruwangwe Ward (Mutepfa et al., 1998).

Survey results revealed that increasing human and livestock population pressure on declining land resource base and rising poverty levels were major causes of environmental degradation in Ruwangwe Ward (Figure 1).

Figure 1: Causes of Negative Environmental Changes

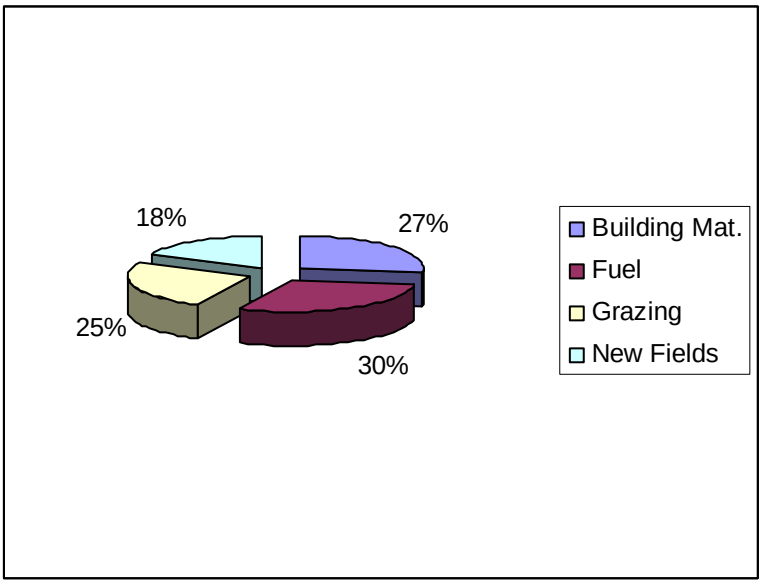


Participants in the FGDs expressed similar views. These findings confirm trends elsewhere in Sub-Saharan Africa and in Zimbabwe's communal lands where population pressure and increasing poverty have accelerated environmental degradation (Whitlow, 1988; Gore et al., 1992; Moyo, 1993; Mutepfa et al., 1998; UNDP, 2002).

Survey respondents also cited vegetation destruction as one of the main negative environmental changes occurring in Ruwangwe Ward. Vegetation destruction, particularly tree felling, is associated largely with the demand for fuel wood (Figure 4), underlining the crucial importance of wood as a source of energy. As discussed earlier, 80% or more of household energy needs in both rural and urban areas of Zimbabwe are

met through fuel wood (Gore et al., 1992; Ministry of Local Government, Rural and Urban Development, 1994). The demand for construction materials and the need for grazing areas were also given as major causes of vegetation destruction in Ruwangwe Ward (Figure 2).

Figure 2: Causes of Vegetation Destruction



Vegetation clearance for new fields was not cited as a major cause of vegetation destruction in spite of the increase in the area under cultivation because many 'new' fields were old fields lying fallow. It emerged that quite often when newly married men approach the village head for land, they are allocated land in grazing areas.

FGDs showed that higher local demand for fuel wood has led to indiscriminate destruction of woody vegetation, while the growing land shortage has increased the incidence of streambank cultivation and the cultivation of hillslopes as shown by API and the survey. These adverse developments have triggered gullying and river siltation. Participants of FGDs also cited bushfires in the dry season, especially in the Garawizi

and Ruwangwe Mountains, as an acute environmental problem. Such fires reduce the amount of dry-season grazing and damage vegetation species. FGDs also cited an increase in livestock numbers in Ruwangwe Ward as a threat to environmental sustainability. Regardless of a diminishing land base, the livestock population in Zimbabwe's communal areas has tended to increase between severe droughts (Whitlow, 1988), resulting in overgrazing, soil erosion and gullying.

Existence of Community-Based Natural Resource Management Institutions

The major focus of the research was to examine the existence and effectiveness of community-based natural resource management institutions. Survey and FGD results were therefore crucial in identifying the local level natural resource management institutions in the ward, and the effectiveness of these institutions in natural resource management. Therefore survey and FGD results were analyzed specifically to examine the management of arable land, woodland resources as well as grazing. Of special interest here was an investigation of the institutional arrangements in the study area to tackle environmental deterioration, and enhance sustainable natural resource management. Survey results showed that land allocation was perceived as the responsibility of traditional leaders (Table 2).

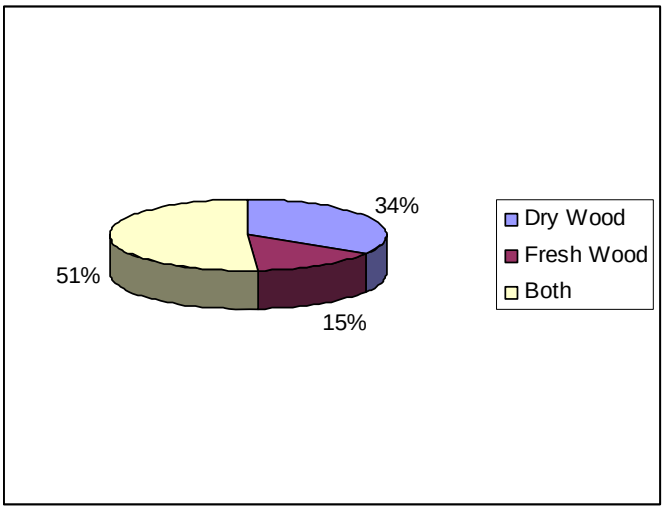
Table 2: Land Allocation – Responses by Village (%)

Village	Traditional Institution	Government Institution
Kwaedza	100	0
Musurudzi	99	1
Rugare	95	5

FGDs confirmed that land is usually allocated by the village head, who then informs the resident agricultural extension officer and the councilor. Participants of FGDs indicated that in practice village heads rarely involved government officials, for two reasons. Firstly, they claimed that traditional leaders often accepted bribes and favored relatives. Secondly, they also argued that there was suspicion and conflict between traditional leaders and locally based state officials. The local councilor when interviewed explained that to reduce conflict it was decided locally to make the village heads VIDCO chairmen. In this way it has been possible for traditional leaders to continue to be involved in land allocation. This is a unique departure from the prescribed practice in Zimbabwe where all members of the VIDCOs and WADCOs are elected. However it appears that conflicts still exist between the traditional and the modern resource management institutions. This confirms the contention that state intervention in natural resource management in LDCs has either destroyed or weakened CBNRM institutions and created conflict, resulting in environmental degradation and unsustainable resource management (Jodha, 1991; Cousins, 1992; Davis and Wali, 1993; Lynch and Alcorn, 1994; McElwee, 1994; Murombedzi, 1994; Rich, 1994; Adams, 2001).

Villagers' views on the management of woodland resources were quite varied. With regard to the harvesting of wood, the conclusion that could be drawn form the survey results was that both fresh and dead wood are harvested (Figure 3).

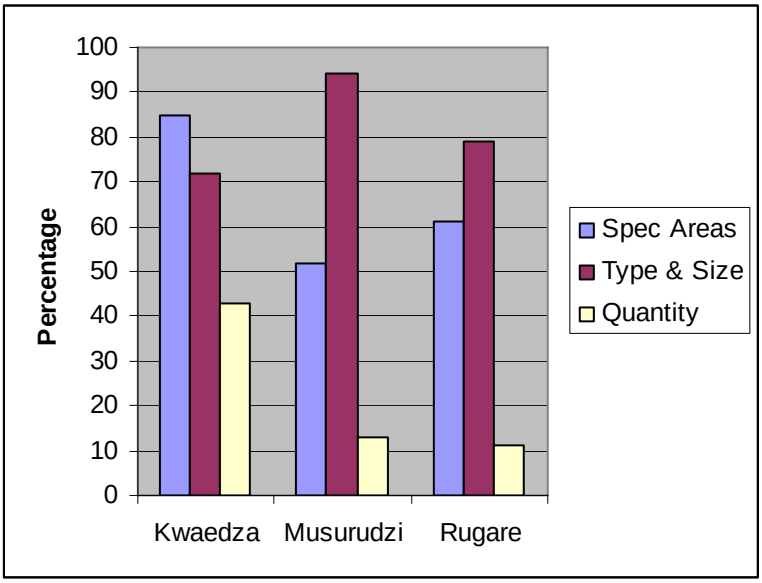
Figure 3: Type of Wood Harvested



FGD participants indicated that some households resort to illicitly felling fresh trees if they fail to get dry wood within walking distance of their homesteads.

Although most of the households in the survey were aware of regulations on the management of woodland resources, there were important differences (Figure 4).

Figure 4: Existence of Regulations on Wood Harvesting



The majority of sampled households were aware of institutional rules that specify areas where wood may be harvested, as well as the type and size of such wood. However,

when it came to the quantity that could be harvested, only 43% of respondents in Kwaedza, 13% in Musurudzi and 11% in Rugare were aware of institutional rules on quantity. This finding indicates that no regulations exist on the actual quantity of wood that villagers should harvest. FGDs revealed that although there are no specific institutional rules on quantity, households were expected to harvest just enough to meet their short term needs. As discussed earlier, community-based management of woodlands in Zimbabwe's communal lands is problematic (Fortmann, 1992; Gore, 1992; Mutepfa et al., 1998; Moyo and Tevera, 2000). This is because rules, monitoring and enforcement mechanisms are unclear and difficult to implement.

FGD participants made a distinction between traditional and modern natural resource management practices. In the traditional set-up, traditional leaders in consultation with sprit mediums formulated resource management rules. Participants stressed that in the past even where dry wood was abundant, there were regulations on where to harvest and the types of wood that could be harvested. There was no harvesting of wood from sacred hills associated with "lion spirits" or "mhondoro" – ancestral spirits believed to have jurisdictional powers over specific tribal areas. All focus groups maintained that wild fruit trees, some tree species associated with vleis or wetlands and those associated with 'lion spirits' would not be felled for any use. Examples of wild fruit trees in this category include *Ficus capensis*, *Cordyla africana*, and *Berchemia discolor*. Trees associated with vleis include *Syzygium cordatum*, *Ficus berkia* and *Adina microcephala*. Trees like *Burkea Africana*, where spirit mediums performed rituals to 'lion spirits', would not be felled. It emerged from the discussions that on the one hand although traditional natural resource management rules exist, they are not enforced. On

the other hand state-based resource management regulations like the EMA by-laws are also not functioning. In addition in some areas, due to scarcity of dry wood, both fresh wood and wild fruit trees are now felled. FGD participants further argued that due to the increasing pressure on woodland resources, there is hardly any selection of tree species that are felled. Therefore any institutional rules that exist are hardly observed.

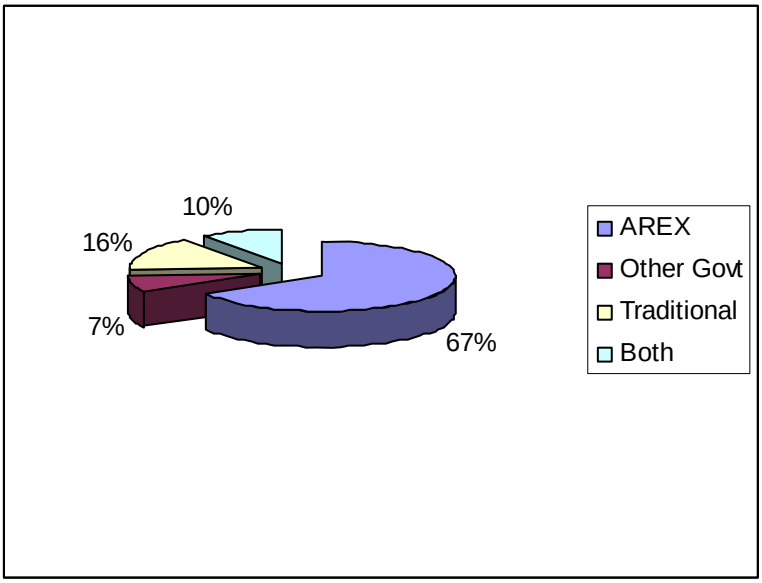
Survey results on the management of rangelands showed the existence of rules governing rangelands. FGDs in all three villages confirmed the existence of traditional institutional rules on rangelands. FGD participants identified several problems related to grazing: rising human population fostering greater encroachment of fields on to pasture, and increasing livestock numbers during good rainfall years exerting greater pressure on rangelands. Therefore both the quantity and quality of grazing in Ruwangwe Ward have declined. This is in agreement with trends elsewhere in Zimbabwe's communal lands (Scoones and Wilson, 1989; Cousins, 1992; Scoones and Matose, 1992).

Survey and FGD results revealed the existence of both traditional community-based and modern government-based natural resource management institutions. While the modern institutions use laws and by-laws to regulate resource exploitation, the traditional institutions depend on community controls. Community controls can involve sacred controls based on religious beliefs, pragmatic controls designed to ensure a steady flow of resources, the civil contract derived from norms of daily conduct, as well as new institutions and rules (Fortmann, 1992). Focus group discussions showed that there are elements of all these community control mechanisms in Ruwangwe Ward. However, like in many communal areas in Zimbabwe, they have been weakened by new, government-based resource management institutions, new residents who do not respect local sacred

tradition and the conversion of more people to Christianity. This has gradually led to either weakening or a complete breakdown of community resource management controls. In Ruwangwe Ward, while there is no complete breakdown of community resource control mechanisms, these have been greatly weakened. Both survey and FGD results revealed that although many households know of the existence of resource management rules, they could not always explain them in terms of penalties and specific management practices. This is a further indication of the weakness of community-based resource management institutions in the area.

Both survey and FGD results revealed problems related to the management of arable land. Results of the questionnaire survey although showing that most of the residents considered the Department of Agricultural Research and Extension (AREX) as responsible for monitoring and enforcing regulations on soils and streambank cultivation, a significant minority indicated that traditional institutions, other government departments, or both systems were responsible (Figure 5). The conflicting views give the impression that there is confusion as to who should monitor and enforce controls on soil conservation and streambank cultivation, suggesting a weakness in the resource management institutions.

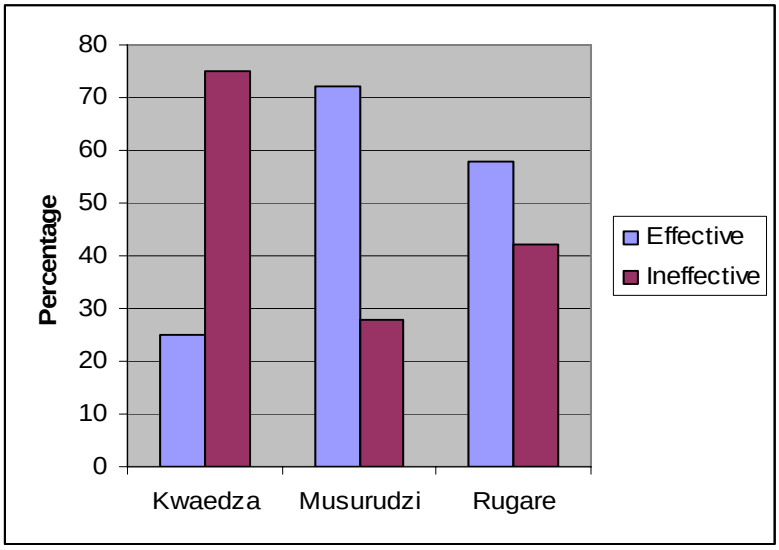
Figure 5: Monitoring and Enforcement of Regulations on Soil Conservation and Streambank Cultivation



Effectiveness of Community-Based Natural Resource Management Institutions

An important objective of the research was to establish the effectiveness of community-based institutions in natural resource management. The effectiveness of these institutions was examined with regard to the management of arable land, woodlands and rangelands. Survey results also showed that the monitoring and enforcement mechanisms are weak (Figure 6).

Figure 6: Effectiveness of Monitoring and Enforcement of Regulations on Soil Conservation and Streambank Cultivation



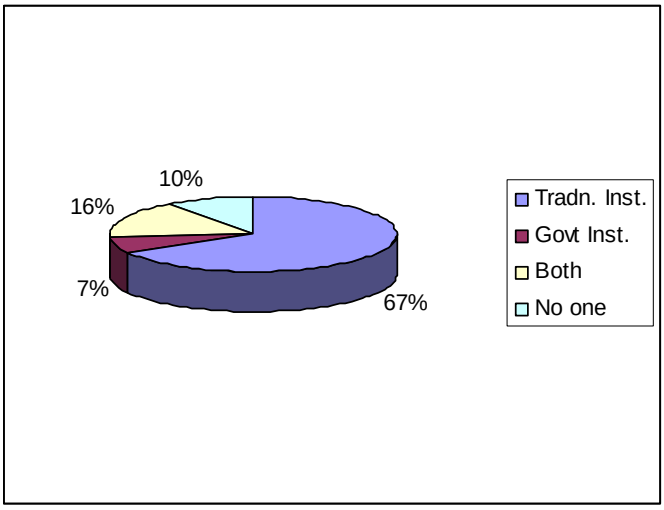
The results show further confusion on the functional status of the monitoring and enforcement mechanisms. This appears to be the result of the imposition of state-based regulations on the local community. Such an outcome suggests that where the state sets the rules for local level resource management, it can be expected that there is no sense of community ownership of such rules. This state of affairs will lead to resource degradation.

While regulations exist on soil conservation and streambank cultivation, FGD participants were adamant that there was neither monitoring nor enforcement of such regulations. They argued that AREX officials were non-functional in that they either took long to visit when invited or never came at all. It has been argued that state control of natural resources in Zimbabwe's communal lands has resulted in loss of local level natural resource management capacity (Cousins, 1992; Murombedzi, 1994; Mutepfa et al., 1998). This has led to unsustainable natural resource management, because the state does not have as rich a source and base of information as the locals. In addition the state

also lacks resources to effectively manage natural resources in the communal areas (Murombedzi, 1994; Mutepfa, 1998; Chikowore et al., 2002).

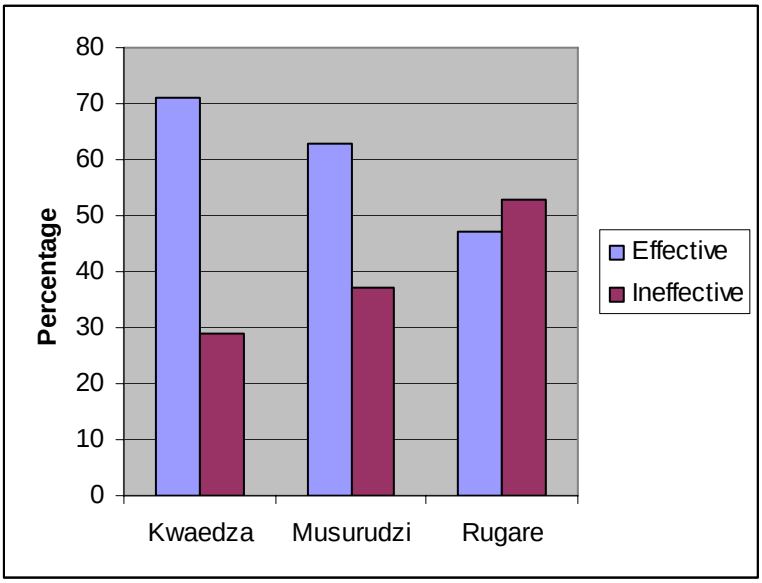
Most of the respondents in the three villages (67%) indicated that the monitoring and enforcement of regulations on woodland resources was largely done by traditional institutions. Some of the households, however, associated this with government institutions or both traditional and modern institutions, while others maintained that no one was performing this function (Figure 7).

Figure 7: Monitoring and Enforcement of Regulations on Woodland Resources



This finding suggests that the management institutions are weak. While 71% of the sample in Kwaedza, and 63% in Musurudzi perceived the monitoring and enforcement of regulations on woodland resources as effective, 53% in Rugare considered the system as ineffective (Figure 8).

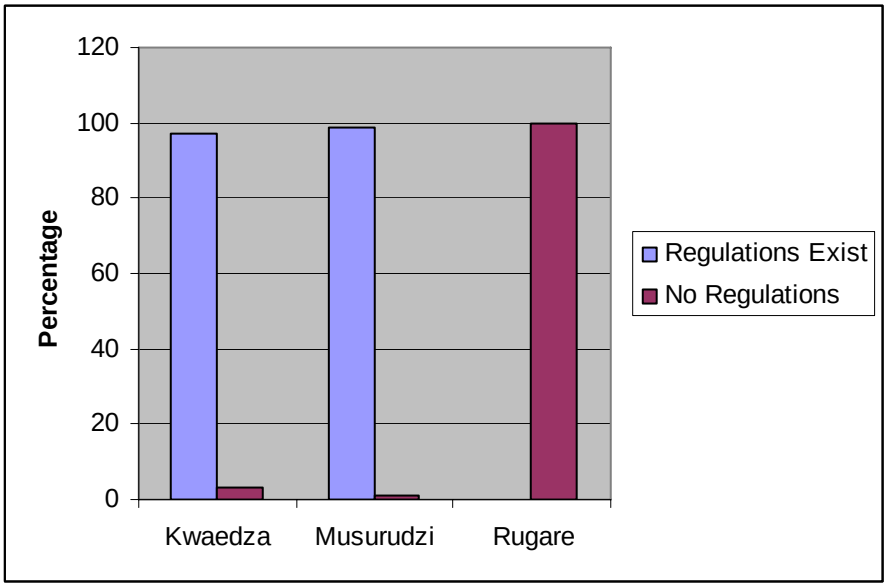
Figure 8: Effectiveness of Wood Harvesting Regulations



The system of monitoring and enforcement seems to be ineffective, as borne out by FGD discussions. Participants of focus group discussions maintained that in the past traditional leaders would monitor and enforce institutional rules. Currently there is nobody performing this role. Others argued that before independence the government then recognized and respected the part traditional leaders played in natural resource management. Queried on the oppressive aspects of colonial regimes, even with regard to natural resource management, the participants maintained that in spite of this negative element, resource management institutions functioned more effectively. They stressed that traditional resource management institutions were severely crippled when post-colonial governments stripped traditional leaders of their power over natural resource management. This is another clear indication that government intervention in local level resource management weakens community-based natural resource management institutions. Unfortunately manpower and financial constraints make it impossible for the state to manage these resources effectively.

With regard to the existence of rules governing rangelands most respondents in Kwaedza and Musurudzi were aware of such regulations, but all the respondents in Rugare expressed ignorance of such institutional rules (Figure 9). FGD meetings revealed that due to the lack of enforcement mechanisms on grazing in the main grazing area, Rugare residents consider the situation as one where no rules exist.

Figure 9: Existence of Regulations on Grazing



Survey results showed that the bulk of the respondents viewed traditional institutions as responsible for monitoring and enforcement of rules on rangelands (Table 4).

Table 4: Perception of Monitoring and Enforcement of Grazing Regulations (%)

Village	Traditional Institutions	Government Institutions	Both Institutions	None
Kwaedza	69.0	8.0	2.0	21.0
Musurudzi	81.0	2.0	6.0	11.0

Rugare	82.0	1.5	1.5	15.0

A significant number of respondents in all three villages, however, were of the view that no one was monitoring and enforcing rules on grazing. It seems that although in theory traditional institutions are supposed to manage rangelands, in practice the system is malfunctioning. FGDs showed that the system was only effective in assigning specific areas for grazing and setting the dates when livestock should be herded and released. Survey results also revealed that rangeland management regulations were generally effective (Table 5).

Table 5: Perception of Effectiveness of Monitoring and Enforcement of Grazing Regulations (%)

Village	Very Effective	Partially Effective	Ineffective
Kwaedza	72	18	10
Musurudzi	51	37	12
Rugare	64	24	12

Although the majority of the households in the three villages perceived the system as very effective, many villagers considered it as partially effective or ineffective. These findings were consistent with FGD results.

Focus group discussions revealed several problems related to the management of rangelands. There is no community control on the size of herds, therefore even when the carrying capacity is exceeded, sizes of herds may continue to grow. Participants referred to the high rates of cattle deaths in Ruwangwe Ward during the 1991/1992 drought as indicative of overstocking in the area. Encroachment of arable land onto grazing land due to rising human population further reduces cattle rangelands. This trend has been blamed for the decline, both in quantity and quality, of rangelands in Zimbabwe's communal

lands (Whitlow, 1988; Cousins, 1992; Scoones and Matose, 1992). FGD results also indicated the existence of inter-community resource conflicts. Villagers, especially those in Musurudzi and Kwaedza who often drive their cattle to the Ruwangwe Range, face increasing competition for pastures from villagers resident in the nearby Nyamahumba and Nyatsanga Wards.

It appears from the results that the management of rangelands is effective only in designating certain areas as grazing lands, and in setting dates when to herd or release livestock. When it comes to the actual utilization of rangelands, management is weak and therefore ineffective.

Focus group discussions also examined the management of water resources. Participants indicated that there is virtually no mechanism for the effective management of water resources in the area, particularly rivers and wells. They pointed out that trees associated with sacred springs and wells like *Adina microcephala* and *Syzygium cordatum* which were never felled in the past are now felled. Participants argued that sacred community controls were effective in managing water resources in the past. The current inability of rivers and wells to store water all year round was therefore interpreted by many participants as evidence of the demise of sacred community resource management regulations.

Although sacred controls contributed positively towards effective water resources management, the current degradation of these resources cannot be entirely explained in terms of the breakdown of sacred controls. Increasing population pressure and recurrent drought have combined to affect the storage capacity of water supply sources in Ruwangwe Ward. Due to the weak state of natural resource management institutions in

the area, the cumulative effect has been to reduce the capacity of water supply sources to store water throughout the year.

Conclusion

API, survey and FGDS revealed that vegetation destruction, soil erosion and the resultant soil impoverishment and river siltation, declining rangeland quantity and quality, as well as reduced water storage capacity are the major negative environmental changes that have occurred in Ruwangwe Ward. The main reasons for these adverse changes include rising human and livestock population pressure on a declining resource base, top down state imposition of modern resource management institutions and the subsequent weakening of community-based resource management institutions. As a result the monitoring and enforcement mechanisms with respect to arable land, woodlands, grazing and water resources in the ward are ineffective. The consequent weakness and ineffectiveness of both state-based and local level resource management institutions have contributed to resource depletion and environmental degradation.

Both survey and FGD results showed that both local level traditional and modern state-based natural resource management institutions in the ward are barely functional. Therefore they have failed to deal adequately with environmental problems in the ward. Although FGD participants argued that resource management institutions wee severely crippled during the liberation struggle, the process in the breakdown of community-based natural resource management institutions started during the colonial era. In spite of their argument that resource management institutions during this period were more functional, FGD participants admitted that this was mainly a result of coercion by central

government and not entirely a result of voluntary participation and local initiatives by villagers. As discussed earlier, the ability of traditional resource management institutions to manage local natural resources was weakened through land appropriation by the colonial state and by top-down land use planning strategies (Cousins, 1992; Murombedzi, 1992; Mutepfa, 1998).

In the post-colonial era, community-based resource management institutions have not recovered because government attempts to take control of land from traditional leaders further weakened local level resource management institutions. FGDs showed that the new post-colonial administrative structures, VIDCOs and WADCOs, have also failed to effectively manage resources. It was clear from FGDs by-passing traditional structures make it difficult to achieve sustainable resource management. Government intervention in local level resource management, both during the colonial and post-colonial eras, has alienated villagers form the management of local resources, and has either weakened or destroyed community-based resource management institutions. This is where initiatives along the lines of CAMPFIRE offer greater potential in reversing the breakdown of local level resource management institutions. Through the active participation of villagers in resource planning and management, community-based resource management institutions will be strengthened and environmental sustainability enhanced.

It has already been stated that most villagers perceived land in general as communally owned while arable land is managed at the household level. If this arrangement is formalized by the state, it could be an important factor for sustainable resource management. The fact that most households are aware of and try to observe

resource management rules is an indication that they recognize the importance of resources and can manage these resources themselves. Most resources were also considered as being on land under the ownership of the community, with the village head and chief being authorities who oversee the management of such resources. This has a very favorable implication for community-based resource management. It means that villagers are willing to function under some kind of authority to manage natural resources in their local area, especially if such authority is from their local community.

If these research findings are anything to go by, it seems that the community is ready to take ownership of their own resources and is willing to learn how to manage these resources in a sustainable manner. The research results also suggest that state intervention in local level resource management has not only been ineffective and has weakened community-based natural resource management institutions, but has also resulted in the development of some elements of open access resources, particularly with regard to woodlands and pastures. Where the state imposes resource management rules on local communities, such rules are seldom consistent with local conditions. State intervention in the management of local resources in Ruwangwe Ward has also excluded local resource users from formulating operational resource management rules. The result is a change in local management techniques, which often culminates in unsustainable resource management (Bromley and Cernea, 1989; Mutepfa et al., 1998; Moyo and Tevera, 2000).

Other reasons for the ineffectiveness of resource management institutions in Ruwangwe Ward are to be found in the absence of the factors that Ostrom (1992) identified as necessary for successful community-based natural resource management. It

seems that the boundaries of villages as well as the individuals or households with access rights to resources are not clearly defined, especially with regard to rangelands. Resource rules, monitoring and enforcement mechanisms were either non-existent or unclear, while little if any monitoring and enforcement of resource management rules seems to be practiced. Furthermore, community controls are now very weak. There seems to be no monitors who audit physical conditions and resource user behavior. Effective resource management requires that monitors be accountable to users and/or are the users themselves. It appears that in Ruwangwe Ward sanctions are rarely levied on users who violate rules governing resource use. This is a major weakness in resource management.

Another fundamental weakness militating against sustainable resource management in the ward is the absence of conflict resolution mechanisms. The simmering inter-community and community-state conflicts over land allocation and rangelands are a case in point. Successful resource management requires that both users and their officials have ready access to low cost local arenas to resolve conflict among users as well as conflict between users and the state.

Recommendations

It is the view of this research that a clear policy framework and holistic planning strategies, focused on community-based natural resource management, are crucial not only for sustainable resource management, but also to ensure sustainable livelihoods for the rural poor who constitute the majority of Zimbabwe's population. The following recommendations are therefore suggested:

- The government must effect tenure security in the communal lands through either customary or statutory law. This will confer proprietorship over resources and

enhance both individual and community benefits. In order to ensure exclusivity there must be an authority, either the state or community, to guarantee tenure security.

- The state needs to define the legal framework that will empower community-based resource management institutions and organizations. Currently the legal environment strengthens the power of the state and RDCs to manage the resource in communal lands. Through the District Councils Act, the district administrator can override the interests of communities in resource management. Therefore legislation that empowers communities is crucial for sustainable resource management.
- Resource management planning must start at community level upwards and not vice-versa. This will obviate conflict between traditional leaders and state officials. It will also make RDCs accountable to communities instead of the current situation where communities are accountable to RDCs.
- The state should relinquish resources to communities with property rights clearly defined, to facilitate implementation of community-based natural resource management. Management of local resources should therefore be the concern of communities under the leadership of local-level authorities who would ensure that:
    - boundaries of the resource areas and the individuals or households with access rights to resources are clearly defined;
    - there are rules specifying the amount of the resource to be harvested to prevent resource depletion;

- opportunities exist for households to be involved in modifying operational resource rules whenever the need arises;
- there are monitors to audit physical conditions and resource user behavior. Such monitors need to be accountable to users and/or are the users themselves;
- there should be clearly defined sanctions which are imposed on users who violate operational rules; and
- there are clearly defined conflict resolution mechanisms for both users and their officials to resolve conflicts among users and between users and officials.

- There is need for a decisive policy shift by government to encourage investment in rural areas particularly in infrastructure, water resources development for irrigation, and rural industries like processing of agricultural produce and crafts. This will generate employment and create a viable alternative to dependence on farming for rural livelihoods. With the land re-distribution programme officially over, it is apparent that the bulk of Zimbabwe's population is still resident in the communal lands, hence the need for sustainable rural development.
- The state needs to build rural resource managerial capacity through financial and technical assistance and strengthening existing community-based resource management institutions and organizations. This will be in line with one of the provisions of the Environmental Management Act that requires the informed, equitable and effective participation of all interested and affected parties in

environmental management (Environmental Management Act : 2002, Part II, Section 4, Sub-section (c)).

- The CAMPFIRE model should be improved and expanded to incorporate all communal natural resources, to facilitate integrated and sustainable natural resource management.
- In line with another provision of the Environmental Management Act, EMA should organize and coordinate environmental education and awareness programmes to increase community capacity to effectively tackle environmental issues, and foster development of 'values, attitudes, skills and behavior consistent with sustainable environmental management'. (Environmental Management Act: Part II, Section 4, sub-section (d)).

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