

# **DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION**

**WORKING PAPER**

**COMMON PROPERTY OR OPEN ACCESS RESOURCES?**

**CONTRIBUTIONS AND CRISIS**

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and  
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**Working Paper AEE 3/96**

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## ABSTRACT

This paper sets to show the contribution of common property resources (CPRs) to the welfare of communal area (CA) households and the crisis faced by CPRs as reflected by their shrinkage, productivity decline and management collapse.

Using formal survey data for Svosve and Mhondoro-Ngezi CAs the results show that both the rich and poor households in the CAs depend on CPRs for their livelihood. The results also show that in the low agricultural potential region, the degree to which households are dependent on CPRs seem to be lower than in a region of high agricultural potential.

An analysis of the contribution of CPRs to household income shows that the poor households depend more on CPRs as a major source of household income when compared to rich households. In Svosve CA, the inclusion of CPRs income to annual income results in a 124 percent and 262 percent increase in total household income for the medium-rich and poor households respectively. In Mhondoro-ngezi the inclusion of CPR income to total annual household income results in a 78 percent increase in household income for the poor households.

The analysis also shows that: (i). the degree of dependency on CPRs for household income seems to be higher in high agricultural potential regions (in this case Svosve CA) than in low potential regions (in this case Mhondoro-Ngezi CA), and (ii). the contribution of CPRs to total household income is higher in the high potential agricultural region than in the low potential agricultural regions across all wealth groups. (iii). the inclusion of CPR income to total household income does not result in any changes in income distribution in a high agricultural potential region and results in increased inequalities in a low agricultural potential region.

Despite their valuable contributions to the communal economy CPRs are being depleted. Due to population increases and lack of well defined property rights regarding CPR utilization and management, the CPRs have turned into open access resources. The consequence is their depletion both in terms of area and of productivity. This in turn induces a further fall in their payoffs, to be followed by further neglect and degradation. An analysis of several indicators shows that there is a physical degradation of CPRs.

The analysis shows that public or government intervention also contributes to the degradation of CPR through ineffective resettlement programmes, and through changes in the agricultural marketing and credit institutions which result in an increase the land under cultivation consequently leading to a decline in the land under CPRs. There is also a lack of management of CPRs which results in an open access to CPRs and hence environmental degradation.

The paper concludes by identifying further areas of research in the form of hypotheses.

## 1. INTRODUCTION

Whilst arable land is owned individually in the communal areas of Zimbabwe, key resources such as grazing, forests/woodlands, forest/woodland products and water (in wells and river systems) are held communally (Murombedzi, 1990). Because these resources are communally owned, they may be termed Common Property Resources (CPRs). Common property resources can be broadly defined as those resources in which a group of people have co-equal use rights. They are non-exclusive resources (Jodha, 1990). Membership in the group of co-owners is typically conferred by membership in some other group, generally a group whose central purpose is not the use or administration of the resource per se, such as a village (Magrath, 1986; Bromley and Cemea, 1989) which is the case in the communal areas of Zimbabwe. In the context of villages in the communal areas of Zimbabwe, the resources falling under this category include community pastures, community forests and woodlands, watershed drainages, dambos, and rivers.

CPRs are a significant component of the communal land resource base. This is more so in the relatively high risk, marginal lands of the communal sector. CPRs contribute to the production and consumption needs of the communal communities in several ways. However, despite their contributions to the welfare of the communal community, CPRs are faced with a serious crisis, as reflected by their shrinkage, productivity decline and management collapse. This paper, based on a rapid rural appraisal and formal survey study of two communal areas of Zimbabwe, presents, at a micro level, the contributions of the CPRs to the well being of the communal community, their present crisis, and future prospects. This paper is one of several papers aimed at studying and finding solutions to the dilemma of CPR management in the communal areas of Zimbabwe.

## 2. Contributions of Common Property Resources (CPRs)

Common Pool Resource contributions to household livelihood at the village level ranges from the direct and more visible contributions in terms of physical supplies to the less visible gains implied by the sustainability of agro-ecological systems. They contribute to rural household food security, employment and income generation, and asset accumulation (directly or through complementing the private resource based activities). However, these contributions are seldom recognized and recorded.

Table 1 presents the percentage households depending on CPRs. The results shows that at least 50 percent of the households in all wealth categories in Svosve CA depend on CPRs for consumable insects, wild fruits, fiber, fuelwood, thatching grass, timber and sand for building. Honey, fish and handicrafts are not popular CPR products in Svosve CA, probably because of low availability. Fifty-six percent of the rich households and 73 percent of poor households depend on CPRs for leaf litter for manure. In comparison, 38 percent of medium-rich households collect leaf litter from CPRs. The rich and medium-rich households are the main groups that benefit from using grazing from CPRs. There are no households in Svosve CA who sell wild fruits as a source of income.

In Mhondoro-Ngezi the CPRs used by at least 50 percent of the households across all wealth groups are fuelwood and thatching grass. However for thatching grass, only 25 percent of the rich households make use of this resource. Rich households and then poor households are the main users of wild fruits and timber when compared to the medium rich households. Thirty-three percent of the medium-rich households and 43 percent of the poor households in Mhondoro-Ngezi depend on insects as a source of food. Like in Svosve CA, the rich and the medium rich households are the main users of grazing as a CPR.

From these results, it can be inferred that both the rich and poor households in the CAs depend on CPRs for their livelihood. It is for specific CPRs that there are differences in the degree of use between the rich and poor households. From the foregoing, the observation that it is the poor who are heavily dependent on CPRs may not be accepted for the CAs of Zimbabwe. The results also shows that in the low agricultural potential region, the degree to which households are dependent on CPRs seem to be lower than in a region of high agricultural potential.

Table 1: Percent distribution of households benefiting from the utilization of CPRs by wealth group by CA

Communal Pool Resource	SVOSVE			MHONDORO-NGEZI		
	Rich	Medium-rich	Poor	Rich	Medium-rich	Poor
Insects	62.5	50	69.7	0	33.3	42.9
Fish	34.4	18.8	27.3	25	25	26.8
Indigenous fruits	75	78.1	87.9	75	30.6	50
Honey	34.4	25	21.2	0	11.1	17.9
Fiber	81.3	78.1	90.9	0	13.9	14.3
Fuelwood	84.4	81.3	97	75	63.9	71.4
Thatching grass	84.4	81.3	93.9	25	63.9	87.5
Timber	81.3	68.8	90.9	75	33.3	42.9
Leaf litter manure	56.3	37.5	72.7	25	13.9	16.1
Cow dung manure	56.3	46.9	24.2	25	33.3	25
Sand for building	78.1	75	69.7	25	13.9	19.6
Handicrafts	3.1	15.6	21.2	0	8.3	14.3
Bricks	43.8	59.4	24.2	25	22.2	33.9
Grazing	31.3	40.6	3	25	16.7	12.5
Sale of wild fruits	0	0	0	0	2.8	8.9

### 2.1 Extent of Communal Household Dependence on CPRs

Owing to the problems of monitoring and measurement, a complete quantification and valuation of the contributions of CPRs indicated in Table 1 is not easy. Further studies during the course of the project phase will attempt to quantify and value some of these benefits derived from CPRs using some direct and indirect valuation techniques.

This section seeks to determine the extent to which communal area households are dependent on the natural resources. In most communal areas, owing to their degradation and reduced productivity (which may be a result of open access), CPRs do not offer high returns to their users. Attention is paid to the relative degree to which the rich and the poor use and benefit from natural resources. Findings from other countries show that the communal poor with limited alternative means of income, depend more on the low pay-off options offered by CPRs; the rural rich depend very little on CPRs (Jodha, 1990).

CPR products collection is an important source of employment and income especially during the periods when other opportunities are almost non-existent. Furthermore, CPR income, despite being likely to be underestimated, accounts for a high proportion of total household income in the study villages. Table 2 presents the results on the mean off-farm, agricultural and CPR derived incomes by wealth category<sup>1</sup>. In both communal areas, rich and medium rich households have significantly higher agricultural incomes than poor households. However, non-farm and CPR derived incomes are not significantly different amongst the wealth categories.

<sup>1</sup> On estimating the income derived from CPRs, income contributions due to grazing and manure - both leaf litter and cattle manure - were not included in the calculations to avoid double counting. The contributions of these products are reflected in the income derived from agricultural production.

In Svosve CA the poor households derive up to 73 percent of their annual income from the utilization of CPRs. The medium-rich households derive an average of 55 percent of their total annual income from the use of CPRs. In Mhondoro-Ngezi, the poor households derive up to 44 percent of their annual income from CPRs.

Table 2: Contribution of different income sources to total household income by wealth category by communal area

	SVOSVE			MHONDORO-NGEZI		
	Rich	Medium-rich	Poor	Rich	Medium-rich	Poor
Mean agricultural income (Z\$)	1520 (52%) <sup>a</sup>	810 (21%)	200 (10%)	1040 (20%)	1040 (23%)	365 (9%)
Mean non-farm income (Z\$)	480 (16%)	900 (24%)	340 (17%)	3125 (60%)	2470 (55%)	1905 (47%)
Mean CPR income (Z\$)	940 (32%)	2110 (55%)	1420 (73%)	1050 (20%)	950 (22%)	1770 (44%)
Percent increase in HH <sup>b</sup> income due to CPRs	47 %	124%	262 %	25%	27%	78%
n	32	32	33	4	36	56

<sup>a</sup> Figures in brackets are the percent contributions of each income source to mean household income.

<sup>b</sup> HH is household.

In Svosve CA, the inclusion of CPRs income to annual income results in a 124 percent and 262 percent increase in total household income for the medium-rich and poor households respectively. In Mhondoro-Ngezi the inclusion of CPR income to total annual household income results in a 78 percent increase in household income for the poor households.

On average, there are no differences in the number of CPRs households collect or use across wealth categories in both CAs. However, the mean number of CPRs collected by households in Svosve CA is higher than those in Mhondoro-Ngezi CA (Table 3).

From these results, three inferences can be made. Firstly, the poor households depend more on CPRs as a major source of household income when compared to rich households. Secondly, the degree of dependency on CPRs for household income seems to be higher in high agricultural potential regions (in this case Svosve CA) than in low potential regions (in this case Mhondoro-Ngezi CA). Thirdly, the contribution of CPRs to total household income is higher in the high potential agricultural region than in the low potential agricultural regions across all wealth groups.

Table 3: Mean number of CPRs used by households by wealth category by communal area

	SVOSVE			MHONDORO-NGEZI		
	Rich	Medium-rich	Poor	Rich	Medium-rich	Poor
Mean # of CPRs used	9	9	9	5	4	5
Maximum # of CPRs used	15	14	14	7	17	17

## 2.2 CPR utilization and income distribution

The income distribution effects of including income derived from CPRs to household income is analysed using the Gini-coefficient. The Gini-coefficient is an aggregate inequality measure and can vary from zero (perfect equality) to one (perfect inequality) (Todaro, 1982). The hypothesis is that the inclusion of CPR income in total household incomes reduces the extent of communal income inequalities. The results of the analysis are presented in Table 4.

Table 4: Gini-coefficients excluding income derived from CPRs and including income from CPRs by communal

	Svosve	Mhondoro-Ngezi
Gini-coefficient excluding CPR income	0.49	0.55
Gini-coefficient including CPR income	0.49	0.59

The result of Table 4 show that in Svosve CA, the inclusion of CPR income in total household income does not change income distribution. For Mhondoro-Ngezi, the inclusion of CPR income to total household income increases the inequality in income distribution. Another observation is that income distribution - with and without the inclusion of CPR income - in Mhondoro-Ngezi is more unequally distributed when compared to Svosve CA.

Given these results the hypothesis that the inclusion of CPR income to total household incomes reduces the extent of CA income inequalities is rejected.

## 2.3 Contributions to private farming

The real significance of the CPR-contributions become clear when their time-specific end-uses are examined. CPRs play a complementary role in farming systems based on Private Property Resources (PPR). Table 1 shows that 38 - 78 percent of the households in Svosve CA and 13 - 25 percent of the households in Mhondoro-Ngezi CA, across wealth groups collect leaf litter for manure into agricultural production. In this way CPRs contribute to the productivity of agricultural enterprises.

An analysis of household perceptions on the quality of their arable land shows that CPRs have an important role in improving the productivity of the communal area farming systems (Table 5). In Svosve CA about a third of the rich and medium rich households and 55 percent of the poor households perceive their arable land as of poor quality. Similarly, in Mhondoro-Ngezi 50, 31 and 38 percent of the rich, medium-rich and poor households respectively perceive their arable land as of poor quality. The poor quality land is basically due to soils being sandy, stoney and leached. The high proportion of households using cattle manure as a source of nutrients is an indicator of household coping strategy to deal with their poor quality land. Thus CPRs through the sustenance of livestock contributes to the maintenance or increase in the productivity of arable lands.

A still greater dependence of private resource based crop-farming on CPRs is revealed by the extent of support it receives for sustenance of farm animals. Three to 41 percent of the households in Svosve CA and 13 -25 percent of the households in Mhondoro-Ngezi CA, across all wealth groups depend on grazing as a CPR. An even higher percentage of households depend on grazing for the sustenance of small ruminants. The maintenance of farm animals without the CPR facility would mean a diversion of a substantial proportion of crop lands from food and cash crop production to fodder production. The alternative option of reducing animal numbers to levels sustainable by own fodder/feed resources, would imply loss of own farm inputs e.g. draught power and cattle/animal manure.

Table 5: Household perceptions of arable land quality and use of cattle manure by wealth status by communal area

Field quality	SVOSVE			MHONDORO-NGEZI		
	Rich	Medium-rich	Poor	Rich	Medium-rich	Poor
Good	68.8	67.7	45.5	50.0	68.6	62.5
Poor	31.2	32.3	54.5	50.0	31.4	37.5
- Shallow	21.9	6.3	18.2	0.0	11.1	16.1
- Sandy	18.8	15.6	36.4	50.0	36.1	41.1
- Stoney	31.3	18.8	39.4	25.0	8.3	12.5
- Leached	37.5	50.0	54.5	25.0	30.6	32.1
- Silty	12.5	25.0	15.2	0.0	2.8	0.0
- Poor drainage	3.1	0.0	3.0	0.0	2.8	1.8
Use cattle manure	78.1	65.6	18.2	50.0	83.3	66.1

The key inferences relating to CPR-PPR complementarity can be summarized as follows:

- (i). Due to the short wet period (planting period) and the quantity of manure required for his land, the dry land farmer keeps more animals than could be maintained or fully utilized over the year, by his narrow production base consisting of a small holding and the short cropping season. This implies that high overhead costs of private crop-farming are met through CPRs as a source of fodder and forage.
- (ii). Owing to non-convertability of production flows (and input requirements) of CPR-use and PPR-based farming, CPRs help fill in the resource and product gaps faced by private resource based farming.
- (iii). The pressure on CPRs is greater when the productivity PPR based farming (as during the drought years) is low. Based on the results presented above, pressure on CPRs is greater in areas of high cropping potential than in areas of low cropping potential.
- (iv). PPR based farming in the dryland context can be strengthened through revitalisation of CPRs.

### 3. Depletion of CPRs

Despite their valuable contributions to the communal economy as revealed by Tables 1 and 2, CPRs are among the most neglected areas in development planning in the country. Due to population increases and lack of well defined property rights regarding CPR utilization and management, the CPRs have turned into open access resources. The consequence is their depletion both in terms of area and of productivity. This in turn induces a further fall in their payoffs, to be followed by further neglect and degradation. Of the two forms of depletion of CPRs, the decline in area is relatively easy to observe. In contrast, the fall in productivity of CPRs, although keenly felt by villagers, is difficult to quantify because the productivity has not been recorded in the past. This section will attempt to assess the decrease in the productivity of CPRs using some appropriate indicators.

#### 3.1 Indicators of the physical depletion of CPRs

In the absence of recorded benchmark information for assessing the degradation or decline in productivity of CPRs over time, a benchmark had to be constructed from oral history. The evidence on the reduced productivity and production potential of CPRs presented in Tables 6 and 7.

During the surveys, households were asked of their total land holding and how they acquired the land over the years. Table 6 shows the amount of land opened up by the sample households by time period. In both areas households expanded the area under cultivation over time. Thus as households expand areas under cultivation

(most likely to meet the needs for an increase in household size and an increase in the number of households<sup>2</sup>) the land available for grazing livestock is decreasing. With an increase in livestock numbers and in particular an increase in cattle numbers over time this means the stocking rates increases and hence this may lead to environmental degradation. However, a decrease in the area under grazing does not necessarily lead to environmental degradation. This is mainly because the crop residues after harvesting are also used to supplement cattle feeds during the dry season when cattle feed requirements are critical (Guveya, 1995). Hence an increase in land area under cultivation may actually imply an increase in the availability of dry season cattle feeds.

Table 6: Total hectarage opened up for cultivation over time by communal area

Period land opened	Svosve	Mhondoro-Ngezi
	Total land opened (ha)	Total land opened (ha)
-19	19	10
1961 - 1970	16	14
1971 - 1979	21	23
1980 - 1990	39	26
1991 - 1996	27	38
Sum	122	111

Using the key CPRs used by CA households, Table 7 presents household perceptions on the deterioration of CPRs. In Svosve communal area the proportion of households indicating that there was better grazing, cattle size and more of indigenous tree species in the past compared to today is higher than the proportion of households indicating less. For these same parameters in Mhondoro-Ngezi similar results are obtained expect that the condition today is better than that of 5 years ago and the number of indigenous tree species today is better than that of 5 - 10 years ago. This may be an indicator that CPRs are deteriorating over time.

For milk output per cow per day, in both CAs, the proportion of households indicating that milk productivity is higher today than 5 - 10 years ago is higher than the proportion of households indicating lower productivity. The question then is what makes milk productivity to be higher today than it was 5 - 10 years ago but lower than what it was about 30 years ago. This is an issue that may need further investigation.

<sup>2</sup> In Svosve CA about 21 percent of the households are settled in land designated for grazing. Thus the settlement of households on grazing land greatly reduces the land area available for grazing purposes.

Table 7: Household perception on some indicators of the physical degradation of CPRs by communal area

Indicator	SVOSVE			MHONDORO-NGEZI		
	5 years ago	10 years ago	30 years ago	5 years ago	10 years ago	30years ago
Grazing land condition						
- Better	44.4	46.5	69.2	43.3	60.6	81.3
- Worse	43.5	38.1	3.8	50.0	34.6	7.3
# of indigenous tree species						
- More	53.5	52.4	51.0	29.8	42.3	77.9
- Less	29.3	23.9	5.9	68.3	53.8	13.7
Cattle size						
- Better	47.9	48.8	61.2	55.8	63.5	68.4
- Worse	40.5	40.1	12.3	34.6	27.0	13.7
Milk output per cow per day						
- More	34.6	42.5	66.7	33.3	38.6	69.1
- Less	58.0	48.0	14.6	55.9	49.5	15.9
Time taken to fetch fuelwood						
- Longer	54.6	29.8	17.3	90.4	76.0	32.6
- Shorter	36.1	53.6	46.1	6.7	19.2	55.8
Distance travelled to fetch fuelwood						
- Longer	61.2	34.1	18.9	89.2	81.4	21.7
- Shorter	31.7	54.1	51.0	10.8	12.8	64.1

An important indicator of the reduced productivity of CPRs is the greater time and longer distances involved in collection of the same quantity or less of CPR products today as compared to the past. This finding is supported by the results obtained for Svosve CA. Ten to 30 years ago the time taken and the distances travelled to fetch fuelwood were shorter when compared to today. For Mhondoro-Ngezi the time and distance travelled to fetch fuelwood were only shorter about 30 years ago when compared to today. Why the time and distance taken to fetch fuelwood was longer 5 - 10 years ago when compared to today needs further investigation.

A similar analysis was done by Guveya and Chikandi (1996) with specific reference to cattle performance. Their results indicate that using milk output per cow per day, cattle condition and calving rates as performance indicators, it can be inferred that the quality of natural grazing is decreasing over time.

From the preceding results it can be generalized that CPRs are deteriorating over time. However for some resources in both CAs there seem to be some improvements. The sources of these improvements are areas of further research.

#### 4. Public Interventions and Dynamics of Decline of CPRs

The decline in the area, productivity, and management of CPRs has been a part of the common scenario in most of the developing countries, where these resources continue to be important. The recent literature on the subject attributes the changes to population growth, market forces, public intervention, technological changes and environmental stress (e.g. drought) (Runge 1981, Reperto and Holmes 1984, Ciriacy- Wantrup and Bishop

1975, Bromley and Chapagaain 1984, Jodha 1984a, 1985b, Bromley and Cemea 1989). These factors individually or jointly contribute to the decline and depletion of CPRs. These factors influence the informal or formal norms and arrangements governing people's approach to CRPs. These norms and arrangements can alter with changes in the perceptions and needs the community (Magrath 1986). These changes in turn are reflected through public policies and interventions and local communities' responses to them. This section will focus on the public interventions affecting CPRs.

Public polices and programmes influencing CPRs can be grouped under three categories, namely: (i). those affecting the area of CPRs, (ii). those relating to products and productivity of CPRs and (iii). those influencing the management, usage and upkeep of CPRs. There may be several public measures which fall under more than one of these categories.

#### **4.1 Public Interventions and Decline of CPR Area**

As revealed by Table 6, the privatisation of CPRs to PPR has led to a decline in their extent in the CAs. This change is closely associated with land distribution polices of the government. After the declaration of majority rule in 1980, in 1981 a Ministry of Lands, Resettlement and Rural Development was established to implement a land programme with the goal of settling 162,000 families over a three year period, 1982 to 1985. By 1990, only 52,000 families had been resettled on 3.3 million hectares and the responsible ministry had been abolished (Rukuni, 1994). With the ever increasing human population in the CAs, there is a decline in the area under CPRs as land is opened up for settlement and cultivation. With the failure of the completion of the land resettlement programme, population pressure in the CAs have not been eased.

After independence there were several major institutional changes. The changes included the restructuring of the credit, extension, research and marketing institutions that were primarily servicing large-scale agriculture, to institutions capable of servicing communal farmers. These changes resulted in an increase in production in the CAs. For example, the combination of a 50 percent increase in maize price in 1980, a short-season hybrid seed, a good rainy season and an increase in credit and fertilizer, led to a 147 percent increase in maize production. Cotton followed a similar pattern with the contribution of communal farmers in terms of production and marketing. The increase in both maize and cotton production mainly arose from an expansion in the area under cultivation rather than an improvement in productivity. The expansion in the land under cultivation was and is mainly due to encroachment on CPRs.

With the implementation of the Economic Structural Adjustment Programme in 1990 many workers were retrenched. Though evidence is not yet available, it is most likely that many of the retrenched workers and their families went back to their communal areas. If this is true, this meant an increase in land under cultivation, encroaching more on CPRs.

#### **4.2 Public Interventions and CPR Productivity**

A feature of the productivity raising initiatives for CPRs is their almost exclusive focus on production technology (Gupta, 1987; Shankamarayana and Kalla, 1985; Jodha 1988b). Having a strong input from relevant science and technology, these programmes emphasize techniques rather than community involvement and the user-perspective. Hence one comes across the long inventories of technically well-assessed species of trees and grasses, methods of reseeding rangelands and reforesting wastelands, plant establishment and thinning techniques, and a variety of silvicultural recommendations for community lands. However, there is little in terms of institutional sensitivity of these measures to raise the productivity of the CPRs involved. Moreover, to establish and demonstrate the viability of technological measures, in several cases the community lands are alienated from the people, and transferred to pilot projects etc. (Chambers et al. 1989).

Studies from India shows that one serious consequence of productivity -raising efforts initiated without sufficient concern for the user-perspective is the virtual conversion of CPR lands into commercial production fields, as witnessed in a number of social forestry projects (Chambers et al, 1989; Stewart, 1989; Gupta, 1987). In the process most of the functions of CPRs are sacrificed.

This means there is need for government programmes to consider community involvement in the implementation of research and pilot projects. With community involvement in these projects some of the

constraints to CPR management may be identified and addressed by the communities themselves and at time with the aid of donors and the government.

### **4.3 Public Interventions and Management of CPRs**

Policy, during the colonial as well as post-independence era, has ignored local capacity for resource management and rarely makes use of local ecological knowledge (Murombedzi, 1991; Scoones, 1989). Local knowledge is based on intimate interaction with the environment and on observation. Local knowledge is frequently more accurate on local conditions than the information available to planners. Policy and legislation have however made this knowledge redundant. Ecological holism is not a new concept for rural African peoples, it is simply a concept that their circumstances have not allowed them to apply (Murphree, 1991:15).

State appropriation of the communal lands has essentially limited local capacity to manage resources previously utilized under communal management regimes. It is not possible to reconstruct how common property resources were managed in pre-colonial times. Evidence seems to suggest that while land might have been individually owned, contrary to state ideological constructions, resources such as grazing land, wildlife, timber and other forestry products, water and wetlands were regulated by common property regimes (Murombedzi, 1991).

State assumption of control over resources results in local institutions losing their legal rights to control the utilization of and access to that resource. The state, however, because of logistical limitations of staff and funding and also because it operates at some distance from the users of resources, is unable to put effective management institutions in place. It has also been observed that the state's principal objective in centralizing control over resource use is to assert political authority over local interests and not to create new or more effective resource management regimes. It is almost axiomatically true that central governments cannot achieve "congruence between rules and physical reality" (Ostrom, Gardner and Walker, 1994). The practice has been for the government to impose rules and regulations from outside the local situation. These rules are supposed to restructure the entire situation for the better. But agents of the central government usually lack both the incentives and information necessary to devise optimal rules. How such rules are monitored, and enforced is rarely addressed.

The ability of traditional authority structure to manage common properties during the colonial era was seriously eroded by their co-optation into the colonial administration as part of the strategy of indirect rule. These authority systems could not function effectively in land and resource management when the tenure status of the land had changed to state land. Local traditional authorities had usufructural rights only and powers of exclusion and access to certain natural resources (e.g. wildlife) were denied to them (Murphree, 1991:4). Thus the conditions for a genuine communal property-rights regime were removed. Under these conditions, and with the state effectively unable to manage resources, resource use tended to acquire the characteristics of an open access system. It is not surprising therefore that CPRs in the communal lands have been the scene of greatest environmental degradation in the country.

Local political processes however exist which attempt to define and maintain common property regimes for key resources in the communal lands. The failure by the state to recognize these processes or to encourage the development of systems of group rights has slowed down the development of appropriate management regimes for the key resources (Murombedzi, 1991). Thus there is an urgent need for policy solutions to take into account these processes to ensure sustainable resource use in the communal areas.

It is also likely that common property would be better organized through clear legal powers at the local level for conflict resolution, resource allocation and exclusion, local enforcement, and co-management between local institutions and resource owners (both private and public). With appropriate safeguards on common property rights, commons could provide a good institutional base for diversification in resource exploitation. Changes in tenure and the institutions of land and resource management which involve a decentralization and devolution of proprietorship and economic control may also devolve benefits appropriately.

The discussion above on dynamics of decline of CPRs suggests that the process is a product of several inter-related factors.

## **5. Summary and areas of further research**

CPRs are a significant component of the communal land resource base. This is more so in the relatively high risk, marginal lands of the communal sector. CPRs contribute to the production and consumption needs of the communal communities in several ways. However, despite their contributions to the welfare of the communal community, CPRs are faced with a serious crisis, as reflected by their shrinkage, productivity decline and management collapse.

Using formal survey data for Svosve and Mhondoro-Ngezi CAs the results show that both the rich and poor households in the CAs depend on CPRs for their livelihood. It is for specific CPRs that there are differences in the degree of use between the rich and poor households. For example the rich use grazing resource more than the poor households. The results also show that in the low agricultural potential region, the degree to which households are dependent on CPRs seem to be lower than in a region of high agricultural potential.

An analysis of the contribution of CPRs to household income shows that the poor households depend more on CPRs as a major source of household income when compared to rich households. In Svosve CA the poor households derive up to 73 percent of their annual income from the utilization of CPRs. The medium-rich households derive an average of 55 percent of their total annual income from the use of CPRs. In Mhondoro-Ngezi, the poor households derive up to 44 percent of their annual income from CPRs. In Svosve CA, the inclusion of CPRs income to annual income results in a 124 percent and 262 percent increase in total household income for the medium-rich and poor households respectively. In Mhondoro-ngezi the inclusion of CPR income to total annual household income results in a 78 percent increase in household income for the poor households.

The analysis also shows that: (i). the degree of dependency on CPRs for household income seems to be higher in high agricultural potential regions (in this case Svosve CA) than in low potential regions (in this case Mhondoro-Ngezi CA), and (ii). the contribution of CPRs to total household income is higher in the high potential agricultural region than in the low potential agricultural regions across all wealth groups, (iii). the inclusion of CPR income to total household income does not result in any changes in income distribution in a high agricultural potential region and results in increased inequalities in a low agricultural potential region.

Despite their valuable contributions to the communal economy CPRs are among the most neglected areas in development planning in the country. Due to population increases and lack of well defined property rights regarding CPR utilization and management, the CPRs have turned into open access resources. The consequence is their depletion both in terms of area and of productivity. This in turn induces a further fall in their payoffs, to be followed by further neglect and degradation.

The analysis shows that public or government intervention also contributes to the degradation of CPR through the ineffective implementation of resettlement programmes, through changes in the agricultural marketing and credit institutions. The ineffective resettlement programme has not eased the population pressure in the communal areas. Changes in the marketing and credit institutions have resulted in an increase in the area under crop cultivation resulting in a decrease in the area under CPRs. The slackening management of CPRs due to public intervention has also resulted in the depletion of CPRs and hence environmental degradation.

Section 5.1 presents areas of further research concerning CPRs utilization and management.

### **5.1 Areas of Research to Changing CPRs**

Areas that need research in the project are presented in this section in the form of hypothesis. Across sites the following hypotheses are brought forward:

- (i). in smaller and isolated villages, where traditional social functions are still respected, the decline of the CPRs area is less. The transaction costs of enforcing social discipline regarding CPRs are lower in such cases.
- (ii). in villages at relatively greater distances from market centers (urban centers), where market forces are less effective in eroding traditional values vis-avis CPRs, the protection of the CPR is better.
- (iii). in smaller and isolated villages (often located in bio-physically less favourable environments) the economic compulsions to retain and protect CPRs are stronger.

- (iv). in the villages with smaller initial extent of CPRs, where the communities have fuller knowledge and a concern about their common resources, the decline of CPRs is less. Informal social guarding of CPRs is easier in such areas.
- (v). the decline in the CPR areas is lower in the villages with the following characteristics:
  - a). a lower extent of occupational changes e.g. shift from handicrafts to cultivation, implying an increase in the demand for conversion of CPR lands into private croplands,
  - b). a lower degree of commercialization, implying lesser erosion of social sanctions and informal arrangements protecting CPRs,
  - c). a lower extent of factionalism in the village, implying greater degree of social cohesion, conducive to the protection of CPRs, and
  - d). a lower socio-economic differentiation ensuring equity of access and benefits from CPRs, equal stake in maintenance of CPRs and lesser extent of CPR-grabbing.

Village communities as the key actors in the field, operating under the influence of public interventions or pressure from within (eg through population growth), have contributed to the decline of CPRs at the village level. In the process they have evolved coping strategies with the changing CPR situation. The primary focus of such strategies is maximization of private gains from the worsening status of CPRs. This, however does not exclude small initiatives directed at protection and rehabilitation of CPRs.

Since the extent and type of private gains extracted from the rapidly declining CPRs are very much related to the capacities and needs of individual families, the adaptation strategies are shaped accordingly. Hence one can note differences in the responses of the communal/village rich and poor towards the changing situation of CPRs, although some responses may be common to both.

Further research to be conducted by the project will focus on coping strategies that have been adopted by CA households do deal with the declining availability of CPRs. The following hypothesis are brought forward concerning the relationship between wealth groups and the adaptations in the utilization of CPRs.

The dominant responses of the village rich (large farmers) to the changing situation of CPRs include the following:

- i). withdrawal from CPRs as user of CPR products, as their opportunity cost of labour for collecting and using these products is higher than the value of the CPR products.
- (ii). increased reliance on alternative options. The alternatives include: own supply of biomass, substitution of renewable CPR products by non-renewable and/or external products (e.g. use of solar energy).
- (iii). private squeeze on CPRs as assets, as reflected through the tendency to grab land, preventing others from using their private land during off-season (i.e. seasonal CPRs), and enriching own soil by using leaf litter and/or soil from CPRs to private fields.
- (iv). indifference to management of CPRs despite their influence and ability to use legal-cum-administrative superstructure and public funds (grants/subsidies) available for rehabilitation of CPRs

Perpetuation of these responses would mean further decline in the area and the productivity of CPRs, and ultimate or complete irrelevance of community resources for the rich.

Depending on their capacity, poor households also attempt some of the measures adopted by the village rich. Specific responses by the poor households may include the following: utilise the CPRs as an important source of sustenance and attempt maximization of complementarity between CPRs and PPRs.

At the local community level, the following are hypothesised:

- (i). general acceptance of CPRs as open access resources, following the abolition or disintegration of traditional usage regulations. This is reflected by the absence of users obligations and the consequent over-exploitation of the CPRs on the one hand and the failure to question the non-functional legal and administrative measures relating to CPRs.

- (ii). general neglect of CPRs with a selective management approach to specific CPR types and units. The bulk of the CPRs-unit management events are a by-product of other developments, eg if the area of any CPR helps a village to qualify for a certain grant or relief, they try to keep its area intact even without developing it or regulating its use. From this perspective, the management or future of CPRs is tied to the suitability for other purposes rather than their utility as community assets.
- (iii). higher productivity of CPRs play important roles in inducing their better management. This becomes more important when these gains are shared more equally. The productivity-management linkage, offer a useful clue for breaking the vicious circle of degradation-neglect-degradation characterising CPRs.
- (iv). genuine concern against degradation and misuse of CPRs is an important factor inducing people's action for CPRs.

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