Participation, Adaptation and Learning By Doing — Progress in Participatory Development of Community Based Management Plans for Livestock Feed Resources in Mahuwe Ward, Zimbabwe (R7432)

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Abstract

Progress in achieving project objectives of enhancing the well-being of residents of Mahuwe Ward, Guruve District through improved management of common pool vegetation resources is presented. Following several PRA activities a local co-ordinating committee was elected and assisted with the employment of village representatives and a communication team.

In a series of workshops community members defined community objectives for common pool vegetation resources. These objectives were then ratified by the community at several public meetings. Thereafter workshops were held to identify the factors that affected achievement of the most important of these objectives. Several modelling workshops were then held to identify the relationships between key processes and the achievement of objectives.

A vegetation map was developed by project staff using interpretation of aerial photographs and a community map was developed by community representatives using orthophotographs. These will be validated to establish the utility of both approaches to the project objectives.

A questionnaire survey was implemented to provide baseline data for the project as well as to provide data on local people's attitudes at the start of the project. The questionnaire was also implemented in adjacent wards to provide benchmark data for assessing the effect of the project on changing attitudes and behaviours.

Introduction

Initiated in January 2000, this participatory research project sought to assist communities in Mahuwe Ward, Guruve District of Zimbabwe to enhance their well-being through improved management of common pool vegetation resources. The project sought to facilitate and improve the processes though which local community leaders and community members completed the following core activities:

- Articulation of their management objectives for their common pool vegetation resources
- Identification of best bet management strategies to achieve these objectives
- Identification of the institutional changes required to implement and sustain the best bet management strategies
- Design an implementation plan for the management strategy.

The project sought to achieve these objectives through a carefully designed programme of research, modelling and communication that engaged local community representatives as partners in the research process and enhanced their capacity to carry out the above activities.

Mahuwe Ward, comprising six villages (VIDCOS) in Guruve District is one of the many CAMPFIRE Wards within the semi-arid Zambezi valley. Wildlife and the management of natural resources for economic gain are not new to these communities. But the wards in the eastern Zambezi valley have faced a steady stream of immigrants who seek to stake a claim in the last land frontier of Zimbabwe. Coupled with the declining macro-economic conditions and political turmoil of the first half of this year, the project faces many challenges as it seeks to assist the members of Mahuwe Ward define a set of management goals and then chart a course to achieve those goals.

In this paper we review the project progress to date and present some of the preliminary results. The paper begins with a brief review of project activities since inception in January. Thereafter we highlight some of the key results that have been achieved to date and in the final section we outline major activities that are planned for the next quarter.

Progress in Achieving Objectives

Following several PRA sessions in the Mahuwe Ward a local co-ordinating committee was elected and assisted in the employment of local village representatives (VRs) and a communication team (CT).

A series of workshops were held to identify community objectives with regards the common pool vegetation resources as well as the major factors affecting access to, and productivity of, these resources. The different resource (vegetation) types in the Ward were defined and mapped and their use in space and in time was noted. The objectives defined in these PRAs were presented to the entire community at a series of meetings to seek broad consensus that these were indeed, the objectives that the community sought in managing their vegetation resources. .

The problem of what scale to use as the focus unit of management was not finally resolved and remains a complex and as yet unresolved issue. In some instances it appeared that the VIDCO was the appropriate unit of management. At other times it appeared the Ward, or even a collection of Wards, were the appropriate units. It was eventually decided that the Ward would be the focal unit but it was recognised that different villages in the Ward faced very different problems and might require different solutions or management plans.

In a series of workshops and field activities local and scientific vegetation maps were developed for locally identified vegetation types. A Bayesian belief network model was also developed of the factors affecting the supply of grazing and browse to local livestock.

Two separate vegetation-mapping activities were carried out. In the first the researchers used air photographs to develop a vegetation map of the Ward. In the second local community representatives converted the community sketch map to a georeferenced map.

Ongoing throughout the process has been a set of activities designed to distil the core elements of each project activity and communicate these back to the community. It is our belief that to have a broad based management strategy adopted we need to change attitudes as a precursor to changing behaviours. Thus different communication tools have been used and tested at key points in the process.

Preliminary Results

Livestock Movements-initial PRA

Local informants presented patterns of livestock movements that indicate variations by season, by animal species and by availability of graze and browse resources within and across the VIDCOs and Wards. Maps showing the livestock movements by species and seasons were developed (e.g. Figure 1). Different graze and browse resource types were identified (Table 1) and their availability in each of the six VIDCOs was noted.

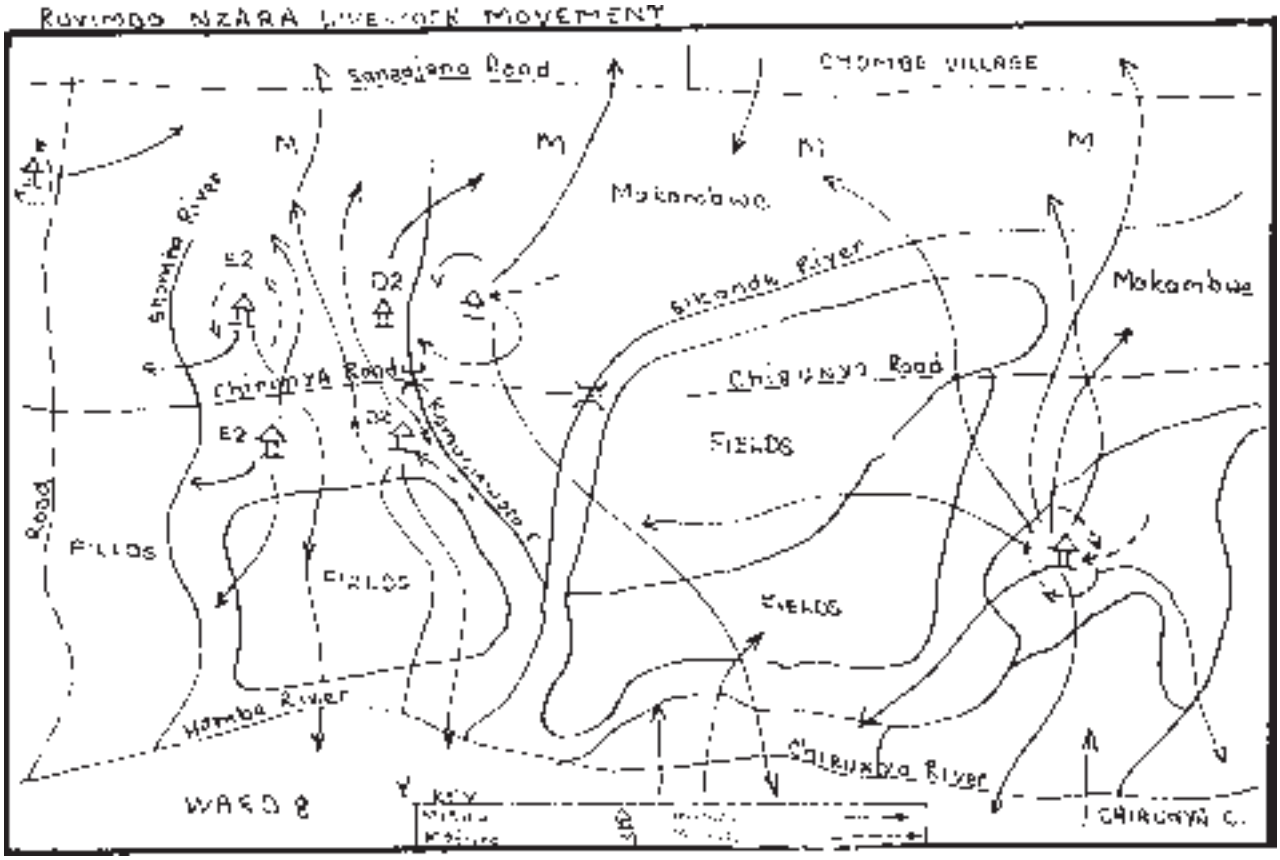
Table 1: Availability of different vegetation resource types in each of four VIDCOs in Mahuwe Ward

		VIDCO		
Graze and browse resource	**Bazooka**	**Nhamoinesu**	**Mufandaedza**	**Ruvimbo**
Valley floor	Yes	Yes (limited)	No	Yes
Around homestead	Yes	Yes	Yes	No
Mountain/ escarpment	Yes	No	Yes	No
Riverine	Yes	Yes	Yes	Yes
Makambwe (pans)	Yes	No	No	Yes
Fields	Yes	Yes	Yes	Yes

During the dry season, there was no restriction on where animals grazed or browsed in any of the VIDCOs. Animals moved freely (unherded) within and outside the VIDCOs and ward in pursuit of grazing, browse, crop residues and water. However, goats did not move very far away from the homesteads, especially to the mountain areas, irrespective of the season. Goats were able to survive on graze and browse around the homesteads and crop residues in the fields. This movement pattern was similar to what happened during drought years. Animals, including goats moved much further away from the homesteads during exceptionally dry seasons. An example of mapped movement patterns for a drought year in Ruvimbo VIDCO is shown in Figure 1.

A much more complex movement pattern existed during the rainy season. During the rainy season, there was control of livestock movements to various sources of browse and graze. These sources were around homesteads, flat or normal grazing areas, Makambwe (seasonal pans), riverine areas and the mountains of the escarpment. However not all VIDCOs had access to each of these sources during the rainy season. Availability of resources and livestock movements during the rainy season, during the dry season and during droughts were detailed for each VIDCO.

Figure 1: An example of a PRA map showing cattle (Mombe) and goat (Mbudzi) feeding patterns in Ruvimbo VIDCO during a drought year (Nzara).



Livestock Herding-PRA

The herding and management of livestock was done at individual household level although some farmers had "Madzoro" arrangements (shared herding) based on personal relationships. There was also a lot of tethering of animals, especially goats and draught animals. There were 'village police' in all the vidcos who were responsible for informing farmers when to start or stop herding grazing livestock. These 'police' operated mainly on orders from the village chairpersons. This set up appeared to be ineffective, however, as there were no powers of enforcement and some farmers were still releasing animals before harvesting was complete.

Management Unit-PRA

Farmers with adequate grazing in their vidcos wished to stop cross-boundary (i.e. Vidco or ward boundary) grazing but there were no mechanisms to prevent it. These vidcos would also prefer the vidco to be the management unit rather than the ward or combinations with other vidcos. These sentiments were expressed in Ruvimbo and Bazooka vidcos. However, Mufandaedza and Nhamoinesu preferred to operate at ward level or in combination with adjacent vidcos as they had very much smaller grazing areas available to them and lacked access to some key resource areas.

Problems Associated with Livestock, *Graze and* Browse *Management*-PRA

Farmers mentioned several problems, which were similar in all the vidcos but varied in seriousness depending on the location of the vidco and availability of grazing resources. The problems included: Shortages of drinking water for the animals in the dry season and droughts: Inadequate grazing due to haphazard settlements and burning of grass in the dry season; stock theft; axing of animals straying into neighbours fields; untimely release of animals before harvesting was completed leading to crop damage; disease; killing of animals by predators such as baboons and hyenas; and people and animals competing for borehole water during the dry season.

Community Resource Management *Objectives*

At the second major workshop each group of VIDCO representatives were asked to identify their VIDCO's objectives for common pool vegetation resource management. These were presented in plenary and the following combined list was agreed upon:

1. To conserve natural, grazing and browse resources.
2. To protect and respect the traditionally sacred places, spirit mediums and traditional leaders.
3. All residents to be aware of their rights pertaining to the use of common pool resources.
4. Residents to appreciate the importance of wise use of natural resources to benefit future generations.
5. To generate income from the natural, grazing and browse resources.
6. For future generations to learn from these resources.
7. To carry out research on how best to manage and use natural, grazing and browse resources in partnership with other interested parties.
8. To carry out reclamation work so as to protect and improve the status of natural resources.

Vegetation Resources: Types, Uses *and Factors Influencing* Productivity

Ten major vegetation types were identified across the Ward (Table 2). At the ward level, the most important of these were Mopani (mopane woodlands) followed by Hova (riverine), Makomo (mountain), Matimba (old fields) and Tsangarawe (rocky areas) in terms of area and importance for livestock and people. This pattern prevailed in Bazooka VIDCO. However some of these vegetation types did not exist in all VIDCOs. For example, Nhamoinesu and Ruvimbo did not have access to the mountain (Makomo) vegetation type. In Mufandaedza the Mopani vegetation type constituted only a very small area compared to Makomo, Hova and Matimba. Hova was the most important for both livestock and people in the VIDCOs after Mopani. The areas of vegetation types and their importance to livestock and people varied according to VIDCOs. Each of the vegetation types was scored to reflect their relative areas and their relative importance to both humans and livestock.

At both ward level and in all the vegetation types there were more tree species than grass species. A total of 49 tree species and 31 grass species were identified in the ward. However the distribution within the different vegetation types varied. The number of different tree species was highest in the Makomo (18), Makambwe (16), Madyo (11) and Tsangarawe (10) vegetation types.

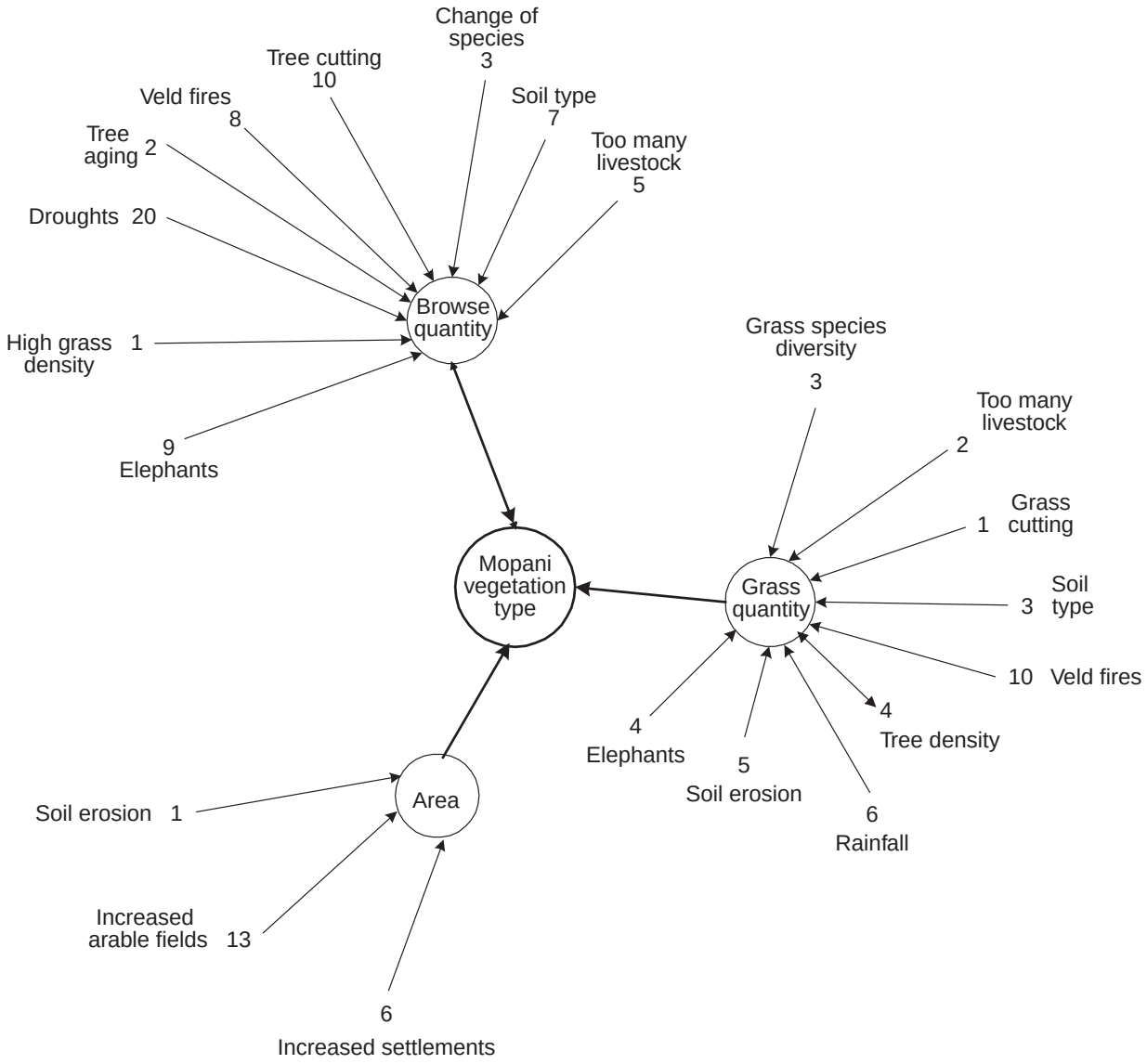
Table 2. Major vegetation / land types described by informants in Mahuwe Ward.

Vegetation type	Description
Mopani	Mopani trees dominant. Other tree and grass species exist.
	Best soils for crop production.
Tsangarawe	Stony and gravel areas with some trees and bushes and poor vegetation cover.
	Aristida grass species present. Low value areas.
Kakomo kakapori	Sacred areas in Nhamoinesu and Ruvimbo.
	Just a small hilly area with various tree and grass species.
Makambwe	Seasonal pans.
Jesse (Tsokoto)	Thickets with little grass growth.
Madyo	Heavy self-churning clay areas. Very fertile.
	Mainly grass and limited tree growth.
Gokoro	Sodic soil areas. Some trees and grasses.
Makomo (Mountains)	Mountains of the Zambezi Valley escarpment with various tree and grass species.
	Sub-divided into crest and valleys.
Hova	Rivers and their banks.

The number of different grass species was highest in the Makambwe (13), Makomo (11) and Mopani (9) vegetation types. There were virtually no tree and grass species in the Gokoro and Matimba areas.

The goods and services obtained by households from each of the vegetation types were considered in detail for only six vegetation types identified by the VRs. These were selected mainly because of their prevalence in the ward and importance to livestock and people. Goods and services from each vegetation type were listed and scored for their relative overall importance in each vegetation type. Although there was variation in the different goods and services from each vegetation type, there was considerable consistency in the top four or five.

Figure 2. Example of spidergram showing the factors affecting productivity of vegetation resources in M*opane* vegetation type, Mahuwe Ward. Scores reflect the relative importance of each factor with the highest score reflecting the greatest impact.



For each of the six main vegetation types, the participants scored the availability of the main goods and services over a 20 year period, using the current supply rate as the standard. Thus for the current period, a constant figure of one was used and availabilities of the goods 10 years ago and 10 years into the future estimated and scored relative to the score for the current time. The indexes given were scored within each vegetation type only and are not comparable across different vegetation types. Although a definite decline in the availability of goods and services was apparent, these indexes did not reflect the real quantities available and the balance between supply and demand for the goods and services today and in the future. Most of the goods and services were shown to have declined over the past 10 years and were expected to decline in the future across all the vegetation types.

The main causes of the decline in the supply of goods and services were identified as the increase in human and livestock populations in the ward. These had resulted in increased and haphazard settlements on grazing lands, increased cutting of trees for firewood, home building and increased cutting of grass for thatching and brick burning.

The factors affecting the productivity of each vegetation resource were identified. Three components of productivity were identified: area of the vegetation type; quantity of grazing; and quantity of browse. The dominant factor affecting the area of Mopane woodland areas was the increased conversion of these areas to arable lands. Veld fires and rainfall were seen as the dominant factors influencing the quantity of graze in the Mopane woodlands and drought, tree cutting and elephants were seen as the dominant factors affecting available browse (Fig 2).

Objective Refinement and Activity Identification

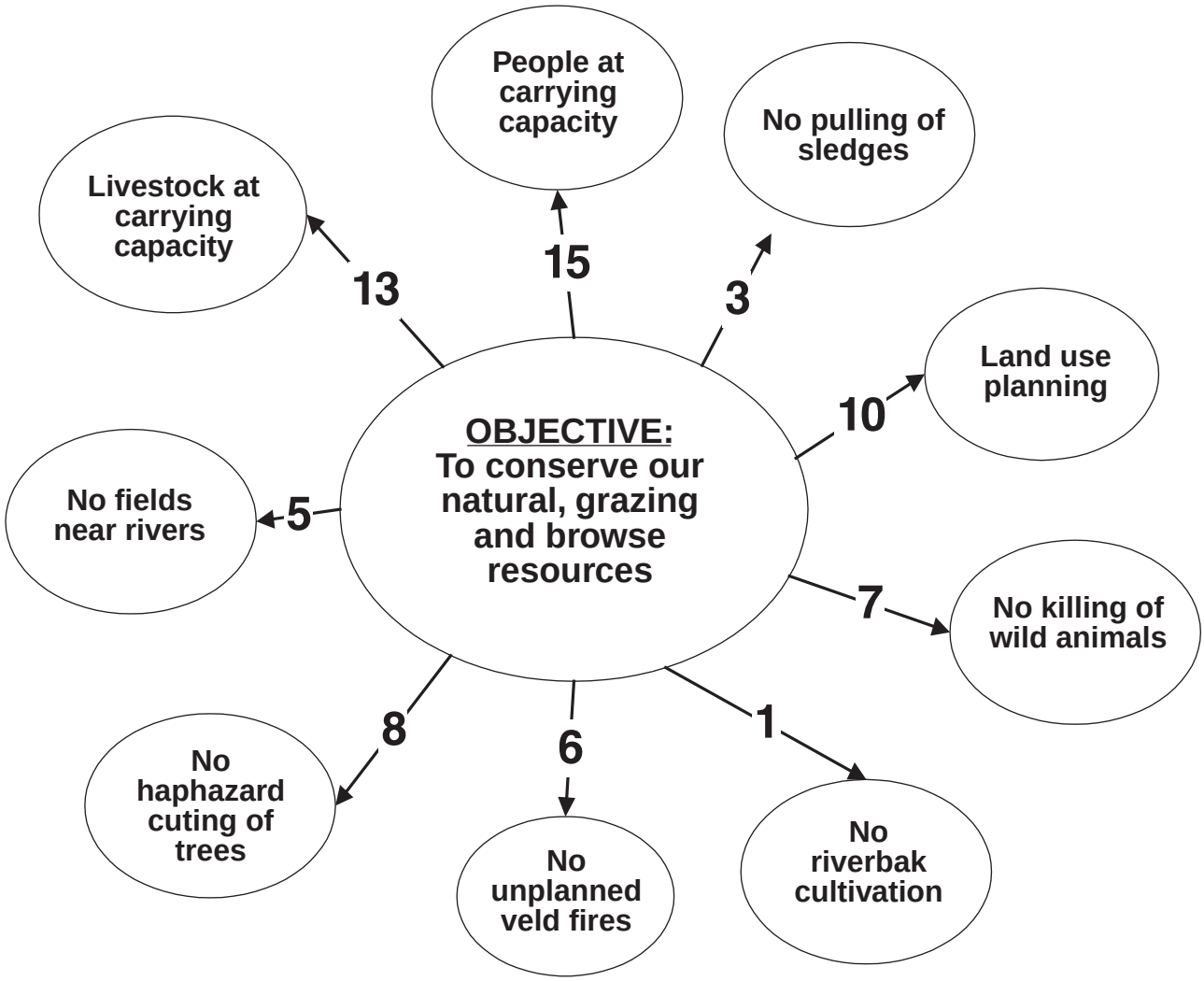
It was recognised that the original set of objectives set by the Ward representatives were at a level of resolution that provided little tangible guidance for project activities. A hierarchical approach to objective setting was used to refine the detail in objectives through setting sub-objectives and where necessary sub-sub-objectives.

At the modelling workshop held in Mahuwe the objectives that had been agreed upon by the whole community were ranked and scored to identify the most important. The most important objectives were:

1. To conserve our natural, grazing and browse resources.
2. Residents to appreciate the importance of wise use of natural resources to benefit future generations.
3. For future generations to learn from these resources.

The sub-objectives of the first, conservation objective are shown in Figure 3.

Figure 3. Sub-objectives with their relative importance scores for the board objective of resource conservation. The highest scores reflect the most important objectives.



It was recognised that the third most important sub-objective (land use planning) would need to be fulfilled in order to achieve each of the two most important sub-objectives (people at carrying capacity and livestock at carrying capacity) and it was, therefore, left out of further deliberations, requiring a focused workshop and set of activities on its own. The workshop thereafter focused on the two most important objectives, livestock and humans at carrying capacity.

The participants were asked to refine the definitions of each to make them unambiguous. The objective for people at carrying capacity was defined as:

"To stop accepting new settlers in Mahuwe Ward by 2003."

Then the objective for livestock at carrying capacity was redefined as:

"To adopt a grazing systems management plan in Ward 7 (i.e. Mahuwe Ward) by the year 2003 that would ensure the provision of adequate grazing resources for livestock."

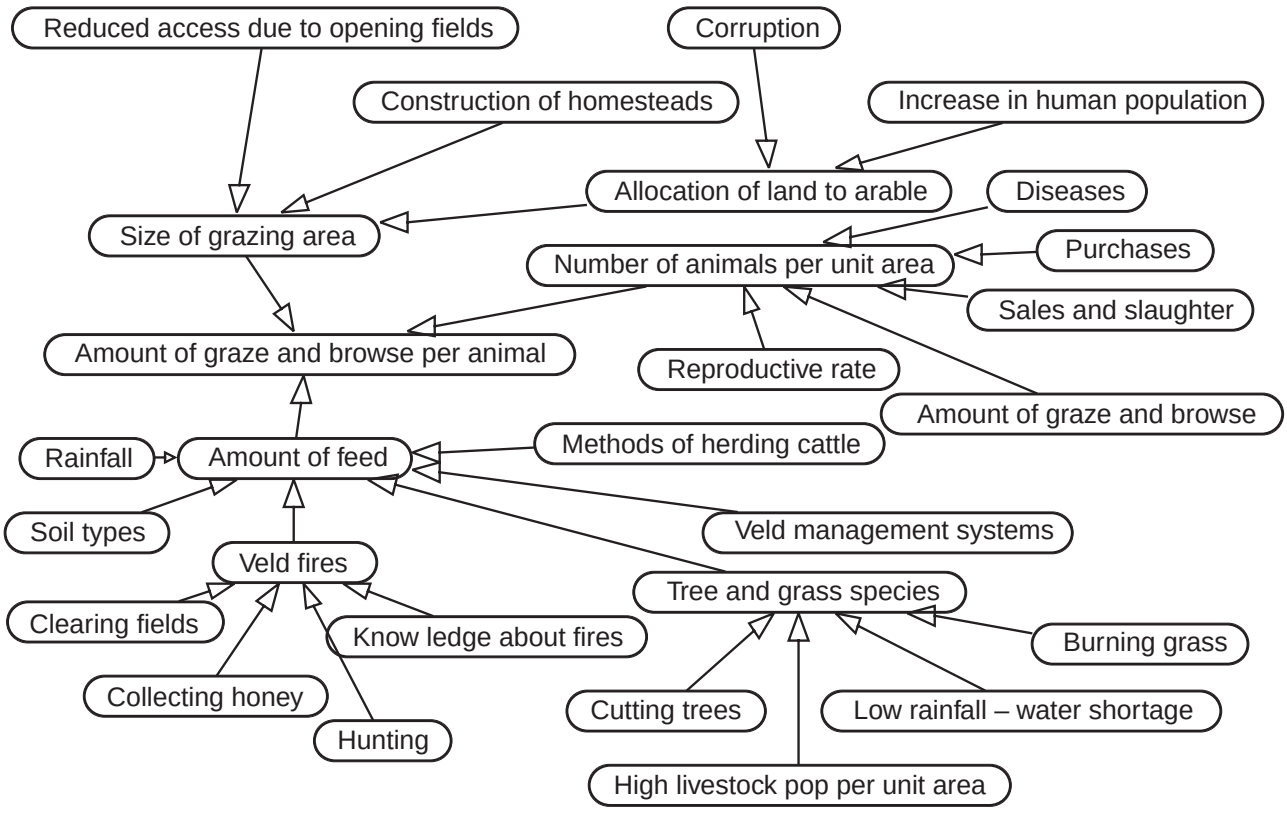
The third sub-objective was redefined as:

"*Demarcation of our area into grazing, residential, fields and kraals in all six* VIDCOs[1] *of Ward 7 by the year* 2002, *accepted by the people.*"

The workshop participants were then asked to define what factors affected the achievement of each objective. It was recognised that the second objective had in fact two sub-components; the first was the development of the grazing systems management plan and the second was the acceptance of the plan by the community. Thus the workshop group were asked to develop spidergrams to address both these issues.

Once these factor spidergrams (e.g. Fig 4) were developed the workshop participants defined the states that each node in the spidergram might adopt. Thereafter the relationships between factor states in each of the input variables and the core objective state were defined. These relationships

Figure 4. Spidergram represents of local views of the factors affecting the available graze and browse per animal in Mahuwe Ward. Weights not shown.



provided the basis for development of a Bayesian Belief Network (BBN) (Jensen, 1996). Research staff developed the computer implementations of the BBNs during the evening and workshop participants manipulated these the following day (e.g. Fig 5).

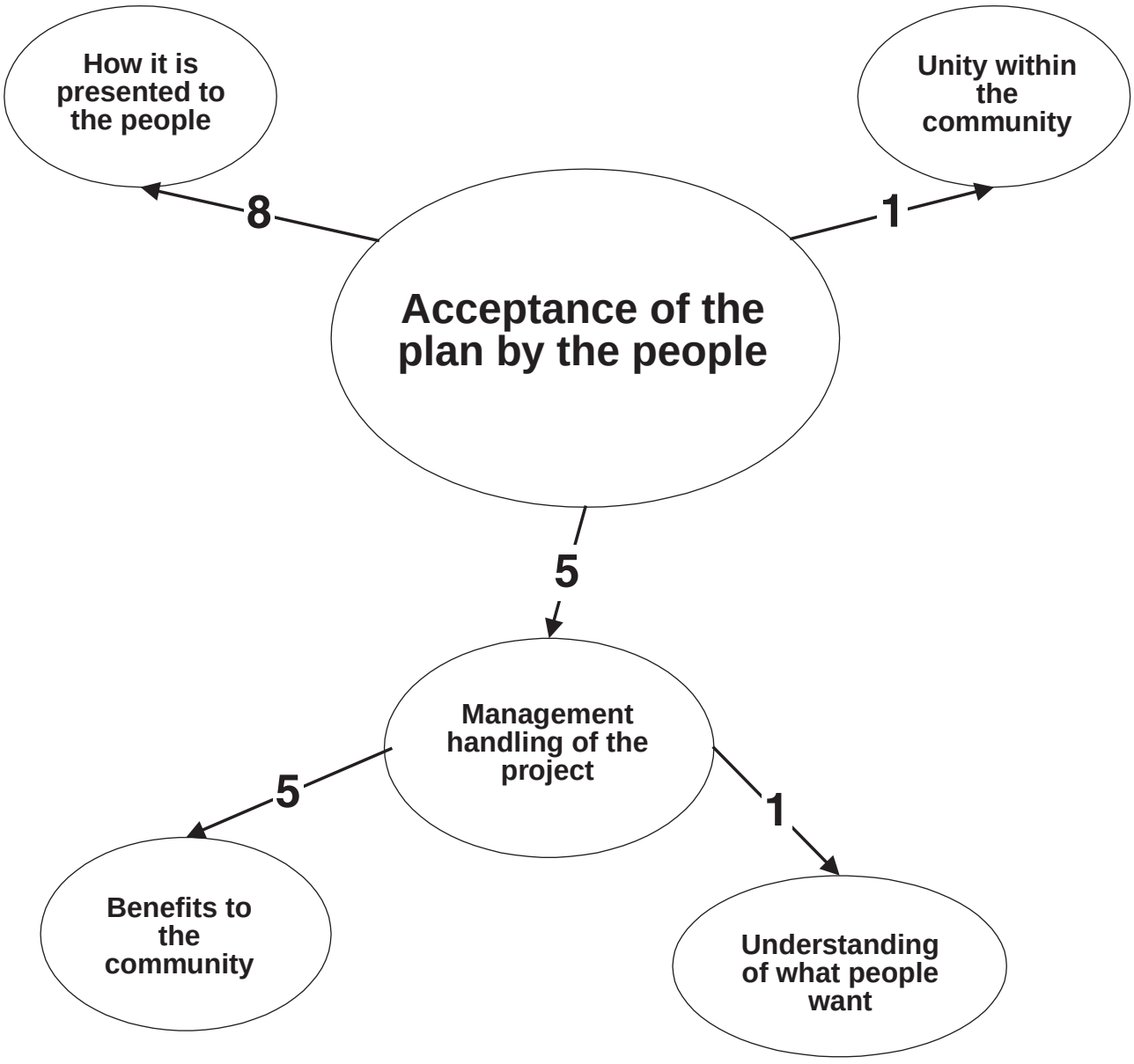
In August a baseline questionnaire instrument was implemented with 770 households being interviewed within the ward and a further 260 in adjacent wards.

Dissemination

In Parallel With These Field Activities The Communication Team Had Developed And Tested Different Mechanisms For Communicating Project Outputs To Community Members And Participants. To Date Experiments Have Included Work With Posters, Pamphlets, Meetings And Theatre. A Formal Evaluation Of These Experiments Has Been Conducted.

The Project Has Also Communicated The Activities To The International Scientific Community At The International Society For Ecological Economics Meeting In Canberra, Australia (Bousquet E*t Al.*, In Press) As Well As To The Cgiar Centres In A Meeting In Penang, Malaysia (Lynam E*t Al.*, In Press). Locally A Newsletter Article For The Agritex Newsletter Is In Press (Chinembiri E*t Al*, In Press) And A Popular Article Has Been Submitted To A Local (Harare) Daily Newspaper.

Figure 5. Factors affecting the local acceptance of management plans developed through the research process. Scores reflect the relative importance of each component with highest scores being the most important.



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Questions and Answers

Does the project team have any specific technological interventions that may increase productivity in the area?

The focus of the work was looking at whether the herding patterns defined the paddocking system.

Earlier the issue of influences on communities that make them more tolerant to new ideas had been discussed. Would project R7432 be doing this, or indeed, did they think it important?

In essence, the project would be looking at that, because in order to facilitate community-scale changes, the whole community needs to be on board.

Is there an interface between extension teams and traditional dissemination tools?

The team hoped that this is a process for extensionists to work with. Part of the project is highly technology-driven, part of it is less technology-driven, so ultimately it must be a joint collaborative decision with the community that defines the most appropriate interventions. The project team originally anticipated improving use of grazing and browse resources through improved herding and fire management practices.

How was the project team able to get livestock owners to participate in such a holistic exercise, in relation to the issue of grazing resources?

The team was trying to get the local people to buy in to the project. As yet there was no specific technology to pass on. There will be a committee of livestock and non-livestock owners. The team will evaluate current institutions and simulate what is likely to be needed in the future, therefore, farmer choice will be a key factor.

As one of the key objectives of the local community is to prevent new people extending the community does the project leave itself open to the support of protectionism against an expanding population? Have scenarios been built into the project to enable appropriate changes to be made in community planning to prevent conflict with newcomers?

This was exactly why the project team had moved to working on facilitating the adaptive capacity of local managers, attempting to enhance their capacity to clearly and correctly identify problems, design and build solutions, monitor their impacts and then iteratively refine this process.

Were cattle still viewed traditionally or as generators of income?

Although it was not clear, the primary need appears to be DAP. The project is trying to find out what other needs people have.

Is it possible to measure changes in biomass production/reduction from the vegetation due to the impact of livestock numbers?

Two parallel systems are required for this, a scientific one and a more simple one that the farmers could use. In the initial design of the project it was thought that only one system was needed, but the farmers said that they should also be involved which is why there are two systems.

Who was taking charge of the communities in which the project working, was it the traditional or political leaders?

The project is working with the council. The co-ordinating committee included traditional leaders, council leaders and other individuals. However, recently the government has given more responsibility to the traditional leaders. Discussions were held with the communities as to how the leadership should be reorganised. In general the committees increased in size and were run by the traditional leaders.