

An Assessment of the Environmental and Social Situation in Nahi Valley gewog, Wangdi District, Bhutan - Results of a Rapid Rural Appraisal

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Introduction

In June 1995 a training workshop for Rapid and Participatory Rural Appraisal (RRA and PRA) was carried out in one of the pilot sites of the Bhutan-German Integrated Forest Management Project (BG-IFMP), the municipality (*gewog*) Nahi Valley in Wangdi District.

The training workshop was to serve the dual purpose of:

- familiarizing the participants (field-level and national-level staff of the RNR-sector, mostly Forestry) with the approach and methods of RRA and PRA
- understanding the environmental and social situation of the Nahi Valley *gewog*, with a strong focus on farmers' needs, problems and potentials.

Nahi Valley *gewog* was picked as the area of study, because it was earlier on identified as one of the pilot areas for BG-IFMP interventions. Part of the *gewog* is defined as a Forest Management Unit (FMU), for which a Forest Management Plan has been drafted. Before the Forest Service is going to begin its development of an operational plan for the FMU, an RRA was seen as a helpful, even necessary step, in understanding how farmers manage their natural resources - with a strong focus on the use of the forest - and what are their needs and priorities. As far as possible, the operational plan for the FMU can then be reconciled with the interests and needs of the people. Thus, the RRA for Nahi Valley *gewog* was also understood as the beginning of a dialogical process between the villagers and BG-IFMP.

It is understood that this was not the first time that the approaches and methodologies of RRA and PRA were introduced to, and made use of, in Bhutan. As a matter of fact, over a relatively short period of time already numerous attempts have been made to initiate analysis and planning with the help of these approaches, as even a sketchy look into the locally available "gray literature" shows². In fact, in the forestry sector a number of RRA applications are known, and for social forestry activities a combination of RRA and PRA procedures have recently been proposed. However, for most of the workshop participants this was still the first opportunity to deal in-depth with RRA and PRA in a practical, action-oriented manner.

The lay-out of the following report follows to some degree the outline which is developed in a very useful recent report on an RRA for community forest management, in line with the expressed wish therein: "It is hoped that this report will serve as a model and reference for future RRA teams."³

² See, e.g., K.Gyeltsen, U.Norbu/D.Desmond (1994): Report of the Rapid Rural Appraisal for Initiating Community Forest Management Activities in Dawakha, Punakha District. UNDP/FAO/FSD of RGOB. Thimphu. - J. Wagner (1994): The Ethno-Botany of Four Villages in Zhemgang Dzongkhag - A Rapid Rural Appraisal. SCF Zhemgang, Bhutan. - Ministry of Agriculture (1994) Sustainable Land Use Guidelines for Bhutan, Vol. IV.1. Guidelines for Participatory Rural Appraisal of Farming Systems. Thimphu.

³ K.Gyeltsen, U.Norbu/D.Desmond (1994): Report of the Rapid Rural Appraisal for Initiating Community Forest Management Activities in Dawakha, Punakha District. UNDP/FAO/FSD of RGOB. Thimphu. P.2.

Methodology

1. Organization

The Rapid and Participatory Rural Appraisal was carried out in two steps. For the introduction to the approaches and methods of RRA and PRA a two-day introductory workshop was held on June 19 and 20, 1995, with 17 participants of the Ministry of Agriculture in the Natural Resources Training Institute (NRTI) Lobesa. The workshop included both theory sessions and practical classroom exercises of the methods which were to be used in the field, and focused already on issues of social forestry and natural resource management which were important for the following field work. The workshop procedure is in detail documented in a separate paper⁴.

The actual RRA team comprised of 13 out of the original 17 participants of the NRTI: A. Baskota, DFO Wangdi FD; N.B. Chuhan, FR Wangdi FD; S. Gyamkho, DFEO Wangdi; S.R. Gurung, DFEO Gasa; T. Dorji, RO Wangdi FD; G. Tshering, RO Punakha FD; W. Dukpa, RO Lobeyesa Range; R. Dukpa, DAO Gasa; D. Wangchuk, DAHO Gasa; D. Chapagai, AHS, Wangdi; K. Tsering, NCS Thimphu; T. Lekphell, PO, LUP MoA; R. Krezdorn, TL of BG-IFMP; and myself as trainer for the group. Thus the team was composed of an interdisciplinary group of foresters, agricultural specialists, land use planner and anthropologist; and it comprised both of people who had prior knowledge of Nahi Valley, and of those to whom the area was new.

The field work was carried out in a three-day interval between the morning of June 21 and the morning of June 24, 1995, and rounded up by a short evaluation session at NRTI on the same day. The team stayed overnight at the school of Nahi Valley which is located centrally in the gewog; and used it as "base camp".

2. General RRA Approach and Principles

While the introductory workshop at NRTI introduced participants to both the concepts of RRA and PRA as presently discussed internationally⁵, it was clarified that the field work in Nahi Valley was following the principles of RRA only, as on the one hand a strong outside team approach was followed, and on the other hand an analysis of the local situation, rather than the facilitation of planning and action by the local population itself, was intended to be achieved.

An RRA approach was followed which can be described as:

"...a social science approach that emerged in the early 1980's. In it, a multi-disciplinary team makes use of simple, non-standardized methods and the knowledge of local people to quickly gather, analyze and evaluate information about rural life and rural resources, which are relevant for taking action."⁶

At the same time, a number of methods were introduced to the investigation team which actually come from the more recent tradition of PRA. In fact, a sequencing of methods was laid out which has many similarities with a PRA approach (see Fig. 1).

⁴ U. Kievelitz (1995): Training Modules for RRA/PRA Training - Bhutan German Integrated Forest Management Project. Thimphu.

⁵ For the most recent discussion and examples from Forestry application, cf. Forest, Trees and Peoples Newsletter April/May 1995, which is entirely devoted to RRA/PRA.

⁶ cf. M. Schoenhuth/U. Kievelitz (1995): Participatory Learning Approaches - Rapid Rural Appraisal and Participatory Appraisal. Eschborn.

The team approach implied that changing small groups of trainees went to the local environment, the farm houses and fields of farmers, and tried to apply the different methods agreed upon beforehand. After the return from the field, some time was used to compile the information systematically, to initiate feedbacking between the different small groups, and to plan the general focus as well as major research topics and methods to be used in the next field outing. Thus, a rapid "zooming in" or focusing on the major issues relevant for Nahi Valley, was achieved. "Triangulation" of different methods and different perspectives for the same issues was used repeatedly in order to verify the quality of information. Lastly, a feedbacking session with representatives of the villagers was also to serve the purpose of checking the quality of the information gathered, of challenging and enlarging the understanding of the local situation, and of furthering the interaction between the local population and the investigation team. Still it has to be understood that the following information from the field is just a first approach towards the reality of Nahi Valley gewog, still incomplete and potentially including some misunderstanding. However, judging from the fact that the team spent only three full days in the gewog, the following documentation of results and insights still shows the power of a solid RRA approach, if only for putting in front of us more questions than ready-made answers about the realities of life in the rural hinterland of Bhutan.

The following methods were made use of by different teams. The general purpose and approach and as well as the actual methodology in the field for each method are briefly described.

3. Mapping

General purpose and approach: The purpose of mapping is to receive a quick understanding of the basic lay-out and characteristics of a region, as the representatives of the region itself see it. This can include all kinds of spatially relevant information both regarding the natural or social environment, but is usually for an introductory method focused on: physical boundaries; rivers; settlements and houses; major agro-ecological zones; important infrastructure.

Applied Methodology: At the beginning of the field workshop, and after an introductory discussion with formal leaders (*gup*) of Nahi Valley gewog, those leaders were asked to make a sketch drawing of the area, including the above characteristics, on a large piece of paper with the use of coloured markers. Guided by questions from the team, the leaders carried out the task in about half an hour. The map was later on actualized by transect walks and other field exercises.

Fig. 1

4. *Transects*

General purpose and approach: Transects are group walks which cross-cut through an area in order to observe and understand patterns of the local natural and social environment. With the help of local people, a group walks, e.g., from the top to the bottom of a watershed, observing the general structure, vegetation, land use patterns, cultivation characteristics and social patterns along the path.

Applied Methodology: The investigation team fixed two routes for a transect walk after the introductory discussion and mapping with the local leaders. The routes were decided upon by using the map and asking the leaders to propose helpful directions. The team was split into two groups which undertook a three-hour walk each in opposite directions (North and South), both accompanied by one formal leader. The walk led from the school to one of the upper settlements in the watershed. The teams had an outline for note-taking, practically identical with the above-named characteristics. After the return from the field, transect sketches were made by both groups. Different small groups and individuals employed the same method during the following days when walking to other parts of Nahi Valley; thus a number of different transect sketches for the whole gewog were compiled.

5. *Semi-Structured Interviews and Focus Group Interviews with Farmers*

General purpose and approach: One of the main methods in both RRA and PRA is the art of dialoguing with individuals or small groups of the local population. The basic purpose is to understand in-depth (in contrast to more "superficial" interview questionnaires which focus on data, not on structures) local attitudes, behaviour patterns, living situations, problems and needs. Both the semi-structured interview with individuals and the focus-group interview with more or less homogenous small groups of people involve the same principle behaviour patterns from the interviewer: listening, not teaching; prompting with qualitative, open questions; directing questions from the more general and "public" knowledge to the more in-depth and personal, "private" sphere; etc.

Applied Methodology: In the field work a wide number of semi-structured interviews were held with individual farmers (approximately 30 households) both in the fields, during work, and in their homes. The time span of such discussions ranged from 10 minutes to about one hour. Interview guidelines were usually not written down, but a focus on either natural resource management or social issues (poverty, health, education) was usually maintained, as was the general direction of discussions from more general aspects of life (e.g. structure of the family) to more detailed questions (e.g. types of forest products utilized at which times of year; problems related to childbirth).

Focus Group Interviews were only carried out in very limited number, e.g. in the beginning with the local leaders of Nahi gewog, or two days later with representatives of better-off families in one farm household. Such interviews were combined with other methods relying on visualization (e.g. wealth ranking; mapping).

6. Seasonal Calenders of Crops and of Minor Forest Products

General purpose and approach: Seasonal calenders shall give an overview of local action over different times of the year. In the field of natural resources, a main focus lies on the cropping calender, connected with questions such as availability and utilization of labour force over the year. In the forest sector an interesting application is the question regarding the local utilization of minor forest products at different seasons, both for subsistence purposes - often as buffers against hunger seasons before the beginning of a new cropping season - and for marketing of products such as mushrooms, ferns or the like. Seasonal calenders are usually established with one or a few informants on the ground by defining a time line and then relating crops or products to this time line with the help of seeds, rocks, drawn lines or the like.

Applied Methodology: In Nahi Valley, different teams established seasonal crop calenders as well as calenders of minor forest products by questioning small groups of people. In the case of the agricultural crops, interviews were held in the rice fields with male and female farmers, and the information sketched in note books and only later on replicated on visual representations (paper and coloured lines for the products), while in the case of minor forest products a group of poor farmers in Hali settlement were asked to prepare a calender on the ground. The results were verified - and in one aspect updated - in the final meeting with representatives of Nahi Valley.

7. Tree Ranking

General purpose and approach: Tree ranking is a well established PRA for forestry method which shall give a visual overview of the importance of different local tree species for different utilization purposes (firewood, wood for agricultural implements, etc.). Ranking is usually done with small groups of local people by asking them to name important trees, which are represented on one axis of a matrix by their leaves or another depiction. Then the different use alternatives are discussed, which again are depicted on the second axis of the matrix. Ranking is then done by the villagers, utilizing seeds or stones to give relative priority to each utilization alternative for each tree. The matrix can serve well to determine overall priorities of trees for local use - this can be established by adding up the different values given by the local people for each utilization alternative of each tree.

Applied Methodology: In the field, one group of the investigation team carried out tree ranking as described above with a group of poor villagers in Hali settlement. The results were verified in the final meeting with representatives of Nahi Valley.

8. Institutional Diagramming

General purpose and approach: The institutional, or Venn, diagramme shall present visual information of the institutions present in a village, as well as institutional connections (mostly to the government sector) between a village and the outside world. The different institutions are usually represented by circles of different sizes, the size relating to the absolute importance which local people give to the respective institution. The distance from the village itself - which is usually depicted in the center of the diagramme - shall indicate the actual intensity of relations which the village has with that

institution. Thus, an institutional diagramme can quickly give an indication of both institutional power structures and problematic institutional relations.

Applied Methodology: One small group of the team asked a focus group of better-off villagers in Yesagom settlement to prepare an institutional diagramme, using cut-out circles arranged in different distances to the village. At the same time, it was discussed which institutions are present in the village, and which relative importance they have. Based on the visual presentation and the information given, a final Venn diagramme was reconstructed after the field trip.

9. *Wealth/Wellbeing Ranking*

General purpose and approach: Wealth Ranking shall establish visual and dialogical information on the local social structure, the characteristics of each social group or strata, and reasons for their relative well-being or poverty. A number of different methods exist; one of the most simple ones which at the same time guarantees anonymity of households, is to ask individual informants - or small groups of people - to make piles of seeds representing different categories of well-being (from very poor to well-off/rich) and their relative proportion in the village. The piles indicate the relative percentage of poverty or "affluence" in the area, while a discussion on the differences between the piles very quickly leads to internal characteristics of the different groups and their reasons for being poor or not so poor.

Applied Methodology: In Nahi Valley, discussions with different age, gender and social groups were held on several occasions, in order to find out about the prevalence of poverty and well-being. Individuals or small groups of people were given a pile of seeds and asked to make different categories of wealth/well-being. Based on this, the people were asked what made the groups different from each other, and to name as many as possible characteristics. Based on this, discussions about how to improve the situation of each social group were held with the same people.

10. *Vision Drawing by School Children*

General purpose and approach: The drawing of "visions" of development or change is a powerful method to depict personal wishes, hopes, fears, desires and aspirations of people. Especially depicted visions of "development" can show the underlying "icons" which motivate people for action. However, such vision drawings are not always easy to interpret correctly.

Involving children in vision drawing has a dual purpose: on the one hand, an important social group is involved in an RRA or PRA which usually cannot voice its concerns in the other discussions or methods. On the other hand, children are the adults of the future whose actions will shape "development" in later years; thus, it is crucial to understand the driving forces for their involvement in action for the future. Vision drawings are a method which is very easy to understand for people of all ages and cultures, as almost everywhere in school drawings are part of the usual curriculum. It is important to guide children in their drawings by giving them a few leading questions.

Applied Methodology: In Nahi Valley, classes III and IV of the local school were visited and asked to prepare personal drawings of how each of the children (a total of about 55) imagined Nahi Valley to look like about 20 years from now. Additional questions asked

were: what professions do you aspire to have? How many children would you like to have?

11. Ranking of Problems

General purpose and approach: The ranking of local problems is one simple application of matrix ranking, which shall serve the purpose to document local priorities in needs (and sometimes desires - as, e.g., provision of electricity, which was named quite often in the field, is less of a problem than of a desire). Usually, a list of different problems is prepared either by asking a larger group of local people, or compiled by an RRA team after several days of field visits. The local people are then asked to give a ranking of priorities, by assigning a fixed number of points (seeds, stones, sticker points, etc.) to the matrix, according to their personal priorities. The individual points can then be added and a priority list obtained. This list can then serve to lead more intensive discussions on why the problems are of high or low priority, and what could be done about them. A next step could then lead directly from problem ranking to a first general planning sequence.

Applied Methodology: In the RRA for Nahi Valley, problem ranking was carried out with individual farmers or small groups at various points in time. For the final feedback meeting (see below), a problem matrix was prepared based on the individually named problems as well as additional perceptions from the RRA team. The list was displayed for the meeting, a few problems were added during the discussion, and then all present villagers were given 10 sticker points each, which they could cluster according to personal priorities on the list. A final count was made after everyone had ranked the problems, and based on this problem list an intensive final round of discussions and arguments was held which centered on the two problems of highest priority (lack of road access; problems with irrigation). The discussion helped to clarify a number of open questions, and served to stress differences of opinion between the villagers and BG-IFMP.

12. Feedback Meeting with Village Representatives

General purpose and approach: The final feedback meeting with representatives of the village is a general feature of all PRA approaches - and usually serves to initiate first planning steps -, but also often used in RRA. It is a means of

- accountability of the team to the local people, giving them an insight of what has been learned and understood about the local situation
- checking the quality of the compiled information, giving villagers the chance to correct information elaborated or displayed
- gather additional information on open questions, or crucial issues, such as priority of problems (see above)
- agree on the next steps of action to take.

A good approach to hold a village meeting is, to agree on such an undertaking at the first gathering between RRA team and village leaders (so that preparations can be made and local people invited), and then to hold it at the end of the field work by: introducing again the context and purpose of the RRA; presenting an overview of information gathered, insights and conclusions; splitting up in small groups to further discuss and verify some prominent issues; and then concluding by agreeing on the next steps to take.

Applied Methodology: The Nahi Valley RRA was concluded by a meeting with about 15 municipality representatives, mostly formal or informal leaders and functionaries (*gups*, better-off farmers, village health worker, teachers). The different results and insights were presented in oral and visual form by each of the four teams which had focused on different issues; then, as the village group was only small, a splitting up into small groups was not attempted, but rather all villagers were asked to prioritize their problems (see above under 11). Based on the results of this ranking, a lively discussion was held on the two problem topics of road access and improvement of irrigation.

Fig. 2

Major Results

1. *General Characteristics of Nahi Valley*

Nahi Valley gewog is one of the municipalities of Wangdi district, located directly west of Wangdi Dzong. The gewog has a total of about 104 households, which are widely dispersed over the whole 65 km² of the total area; only minor clusters of settlements can be identified, which are however referred to by specific names, as the map drawn by the present and former *gups* of the gewog shows (Fig. 2). The school functions as an informal center of the gewog, as it lies in a central location directly at the river (see drawing, Fig. 3), and can provide for a public space which otherwise is not found in the gewog. The distance from the school to the asphalted road which leads from Wangdi to Daga is about 3 walking hours.

The whole gewog forms a natural watershed, and shows a rather undulated terrain with partially steep slopes which are prone to natural erosion. It ranges from an altitude of about 1200 m at the Eastern-most corner to an altitude of about 3600 m in the West. A river cuts the gewog in an East-Westerly direction almost exactly in half (see Fig. 2); while the Northern half is almost evenly populated (see drawing, Fig. 4), the Southern half only exhibits one small hamlet of 6 households (Hali), and is otherwise mainly made up of the Nahi Forest Management Unit.

2. *Management of Natural Resources*

The resource mapping and the transect walks reveal, that the gewog consists of two major and two minor land-use zones (see sketch in Fig. 5):

- the intensively used wetland irrigation zone in the center of the gewog (see also Fig. 4), which covers about one third of the Nahi Valley area;
- the combined forest and forest grazing zone which extends almost over the Southern half of the gewog and covers about 50 % of it;
- two small pockets of yak grazing zones in the Eastern-most high mountain areas;
- two smaller strips of almost pure (protection) forest in the Northern and Eastern boundary of the gewog which is not used for grazing due to steepness and remoteness.

This is not to say that the identified areas are fully homogenous in their resource endowment and use. For example, the forest zone consists of different areas of mixed broadleaf forest and of different types of conifers (see Fig. 5). Also, due to the steep terrain of the gewog one can always find minor zones which, for example due to steep terrain, are not used according to the general scheme of the identified zone. This is especially true for the wetland rice zone, which is interspersed with smaller patches of steep terrain which either show thick undergrowth of brushes or eroded bare slopes (see drawing in Fig. 4). However, for the sake of differentiating major land use areas, the basic division is reasonably accurate and helpful. It reveals for example, that most parts of the forest are not protected from use, but rather are used for grazing of animals as well. While the forests to the North of the river are mostly used for grazing by the inhabitants of Nahi Valley, the forests south of the river are almost exclusively grazed by animals stemming from Gazello. Observation from the Northern slopes reveals that in the forest of the Southern slopes cattle herders with about 10 heads of cattle stay overnight for grazing.

Fig. 3

Fig. 4

Fig. 5

While the forests are thus used for different purposes by the local population (see also section 3 and 4 below), the main resource of Nahi Valley are its irrigated rice fields. Three different canals, which were either built by the military (in Hali) or by the local farmers with support from the government, connect the fields in Nabesa, Yesawom - Yesagom, and Hali with water from the upper areas of the watershed. As the canals are not all carrying water anymore, either due to reduced rainfall in recent monsoon seasons or due to insufficient maintenance from the side of the farmers, some of the areas with high production potentials have fallen dry over the last two years and are presently only cultivated with dry season crops (maize, vegetables like chily) or not at all. The most severe case is the village of Hali whose canal has been dry for the past two years, and whose fields did not even produce any maize crop in the last season. Organization of water users is only very limited: they meet twice a year, mainly in order to agree upon maintenance (i.e. mostly cleaning of canals) before the beginning of the season. Water allotment is apparently not controlled very much, water user fees are not collected, and communal marketing or input provision is not practiced. For maintenance of canal structures, farmers rely on governmental provisions (such as cement), even though they argue that the canals are theirs, not the government's. Potential yields in rice cultivation are, according to the extension officer, up to 2.5 t/ha, whereas in cases of limited water provision due to problems in the irrigation system - water is then rotated among the households, leading in one system to water provision every 22 days - the yields go down to about 0.8 - 1.7 t/ha.

The agriculturally utilized land is split up into different types of use, as the chart (Fig. 6) indicates.

Agricultural Area in Nahi Gewog	
Type of land	Area in acres
Wetland	144.0
Dryland	60.0
Shifting cultivation (tshering pang sing)	47.9
kitchen garden	8.1
Apple orchard	4.2
Orange orchard	2.7
Total	267.0

Fig. 6

The present farming system of most households is a combination and integration of crop production (see section 3 below), animal husbandry and forest as well as fruit tree utilization. The forest is a grazing ground for cattle, provides leaf litter for the animals (*sokshing*) and thus indirectly contributes to fertilization of the fields, as compost is brought onto the fields and chemical fertilizer is not used in the area.

As animals, cattle have the highest importance, as they are used for draught power in rice cultivation, and give milk which is often further produced into cheese. Additionally, pigs, chicken, and to some degree horses are kept. All animals are usually local breed

and not upgraded. Differentiation in number and types of cattle indicates social differentiation (see section 6 below). Yaks are not kept, but some yak herds from the neighbouring *gewog* in the West are grazed on the high Western meadows.

One major problem of the integration of crops, animals and forest are frequent damages by wild animals, mostly wild boars and deers. People try to ward off this damage by spending the nights in the fields before harvest time. However, intensive damages still happen especially in fields which are close to the forest. One effect is that some potential cultivation areas are even given up, as the damage by animals is too big.

3. Seasonality in Resource Use

The seasonal calendars established for both agricultural crops and utilization of forest products reveal clear patterns, as Fig. 7 and 8 indicate. Rice cultivation has the highest priority; three varieties of rice are grown locally (among them experiments are also made with IR 64), but double-cropping is not yet practiced. Rice fields are used for dryland cultivation with wheat and millet cultivation dominating in the months of December to June. Additionally, vegetables such as chilies, beans and potatoes are grown in the months of May to November, mostly in home gardens.

Seasonal Diagramm of Non-Wood Forest Products												
Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mushrooms			-----	-----			-----	-----				
Ferns			-----	-----	-----	-----	-----					
Bamboo	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Wild Asparagus			-----	-----								
Xangthozylum								-----	-----			
Rubia						-----	-----	-----	-----			
Bagium		-----	-----				-----		-----			

Fig. 7

Seasonal Crop Calender												
Crops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Paddy/Rice				Nursery		Trans-plant	Trans-plant	weed ing	weed ing		har vest	
Wheat					har vest	har vest						sow ing
Millet					har vest	har vest						sow ing
Collection of Firewood				fuel wood	fuel wood					fuel wood		
Collection of Forest Products			leaf litter	leaf litter				mush room	mush room		mush room	
Vegetables					sow ing	sow ing	sow ing		har vest	har vest	har vest	
Food Availability	good	o.k.	o.k.	low	low	low	o.k.	good	good	good	good	good
Work Load	low	low	low	med ium	high	high	high	med ium	med ium	med ium	high	med ium
Labour Shortage					yes	yes	yes				yes	

Fig. 8

Accordingly, work load is especially high during the months of May to July and November. Food shortages occur - mainly in poorer households - mostly in the months of April to June. This is the time when edible minor forest products such as mushrooms, ferns and wild asparagus - in some areas apparently also jungle potatoes - are mainly sought, as Fig. 8 amply demonstrates.

4. Major Forest Products

From discussions and interviews as well as from ranking exercises and seasonality diagrammes (see Fig. 8 and 9), a number of insights into the use of the forest are appearing.

First of all, the forest is the provider of wood for both house construction and heating. While the accessibility of firewood is still no basic problem even for farm households in the North and East of Nahi Valley - where most of the areas adjacent to the settlements are used for irrigated rice cultivation -, one problem seems to be the reception of permits for firewood collection. A number of farmers complain that the forest rangers do not come frequently enough; some of them cite that they had to get firewood or construction timber without a permit, and were later on fined by the respective ranger because of their action.

Tree Ranking			
Species	Construct- ion Wood	Firewood	Fodder
Walnut	24		
Champ	19		
Blue Pine	24		
Chir Pine	19	26	
Oak	8	41	17
Chilaune	6	10	
Ficus			27
Celtris			25
Erythina			14
Rhododendron		20	

Fig. 9

Secondly, the forest is a provider of minor food products, such as ferns, herbs, wild asparagus, mushrooms (apparently about 9 types are recognized as edible) and jungle potatoes. While in general these products do not play a major role in the diet of the farmers of Nahi Valley, they are an important source of nourishment as well as income especially for the poorer section of the local society and at specific times of year. In the "hungry season" before the arrival of the monsoon, the collection of such minor forest products serves to overcome the food gap of poor households, and is a possibility to receive small income - such as selling a kg of mushrooms on Wangdi market for a price up to 20 Nu.

Regarding the issue of social forestry, farmers are in general not very interested to interact with the Forest Services Division. On the one hand they still have enough forests close-by which they can avail of through their traditional use rights and with the support of issued permits; on the other hand they perceive, just like the Forest Services Division, social forestry mainly in terms of communal afforestations, for which they neither want to render precious agricultural land nor do they seem to have a high communal spirit or experience.

However, many farmers would be highly interested in receiving support for the raising of fruit trees. Presently already a number of farms have limited numbers of fruit trees - mostly apple, peach and pear - in their home gardens close to the house. As the farmers recall, there are however serious problems with fruit pests. It seems that neither the agricultural extension worker can help them in this regard, nor does the Social Forestry Extension Officer play any role concerning these problems and needs of farmers in Nahi Valley.

5. ***Institutions and Institutional Connections***

Discussions with villagers and key institutional representatives such as the *gup*, the village health worker and the teachers of the local school, as well as the development of an institutional diagramme (Fig. 10), revealed a complete picture of the institutional landscape of Nahi gewog and its connection to the outside world.

Inside Nahi Valley, there are only five major institutions present:

- the agricultural extension worker, who has an office close to Yesawom, and who has been in the area for the last two years. He gives extension in the fields of wetland and dryland cultivation, mostly regarding improved rice and wheat varieties, tests and evaluates them together with farmers, and advises on crop pests. He does not have any extension material, but relies mainly on his experience when counseling the farmers in regular monthly rounds through the settlements. The extension office will soon be strengthened or replaced (This is not decided yet, according to the extension worker) by an RNR training center which has already been constructed a little to the East of the present extension office;
- the gup, who is the formal representative of the gewog, being elected by formal vote from the local public (there is usually only one candidate). He represents the public in all matters coming from the district, such as in the trimestrial district planning meetings;
- the local primary school which has five teachers (two of them Indian) and 138 children in 4 classes plus pre-school. The school is basically a boarding type, with more than 100 children presently staying in one boarding house and one of the school rooms. Admission fees to the school including boarding and food are only 120 Nu. per year, and the wearing of a school uniform (about 200 Nu.) is not required. Still only about 50% of all households in Nahi Valley presently send their children to school, as a census of 1995 revealed;
- the village health workers (VHW), who are elected volunteers from the village, carrying out aid in cases of minor health problems. VHWs are, because of their services to the community, exempted from public labour contributions. Presently three VHWs are found dispersed over Nahi Valley. They usually go monthly to Wangdi to buy medicine which is often required in the gewog, but according to a number of villagers, very often they do not have the necessary medicine, and as they have not received any formal training, they can be of little help only. As they mostly make referrals to Wangdi military hospital anyway, villagers in cases of illness usually first consult a *lama* who will carry out a *puja*, and if such spiritual healing will not suffice, they go directly to Wangdi;
- the monasteries are a further institution in Nahi Valley; there are still a number of them for either monks or nuns. Most of the monasteries own land which is usually cultivated by sharecroppers on a "one-third (monastery) - two-third (farmer)" or even on a "fifty-fifty" basis. As mentioned, the monasteries perform important functions not only for religious practice of the villagers, but also with regard to spiritual healing.

Fig. 10

Outside institutions, with whom the gewog has relations, are in order of general importance: the Forestry and the Agriculture Divisions of the Ministry of Agriculture (MoA), the Dzongkhag (district) administration, the bazar and the military hospital in Wangdi, the Animal Husbandry Division of the MoA, and finally the outside monasteries. However, when looking at the frequency and intensity of relations, it shows that the Dzongkhag administration has overriding importance to the villagers who made the Institutional diagramme, and that Agriculture still ranges in intensity before the Forestry service. This is in line with the observations and discussions regarding the insufficient frequency of visits of Forest Rangers for the issuing of permits for firewood and construction timber, and points towards a perceived deficit (cf. section 4 above).

6. *Social Structure and Poverty*

A number of wealth/wellbeing ranking exercises in the field (see Fig. 11) as well as direct observation and discussion with a number of households revealed that clear differentiations in wealth and wellbeing exist among the inhabitants of Nahi Valley. Partly these differentiations have a spatial expression: the Hila settlement is, by agreement of everyone, the poorest area in the valley - partly because of the dried up irrigation canal which made harvests in the last two years impossible, partly because this settlement apparently has been established not too long ago, after all of the fertile lands on the opposite slope of the watershed had been taken under possession and cultivation already. In Hila, one finds several examples of the rather unusual case of two families sharing one farm house; also Hila is one of the very few places where small huts can be found which are not solid constructions like the usual Bhutanese farm houses, but rather are built of woven mats. In contrast to Hila, Yesawom and Yesagom are the most favourable areas in which a number of better-off farmers can be found, who own up to 15 acres of fertile irrigated land (see Fig. 11)..Aside from this clear spatial differentiation, however, there are also numerous poor households found in small pockets of Yesawom, Yesagom, Nabesa or Hebisa, for example.

Wealth Ranking of Nahi Valley undertaken by school teachers)			
"Rich"	"Self-Sufficient"	"Average"	"Below Average" (poor)
7 families	30 families	42 families	25 families
Land: 8-12 acres	Land: 5-8 acres	Less land: 0-4 acres	No or little land
Much cattle/livestock	Cattle	Less cattle	No or little livestock
Machines	Sufficient man-power	Low income	large families
Business	-	Supported by service members from family	Seasonal wage earners
Employers	Hard-working	Hard-working	drawn to alcoholic liquor (in some case)
Good shelters, dress	Shelter, dress o.k.	Shelter average, dress satisfactory	poor shelter and dress

Fig. 11 (a)

Wealth Ranking of Nahi Valley undertaken by different groups			
Group/ Criteria	"Self-Sufficient"/ ("rich")	"Average"/ ("intermediate")	"Below Average" ("poor")
Rating by young females	28% (7 seeds)	40% (10 seeds)	32% (8 seeds)
Rating by older, better-off males	11% (7 seeds)	32% (20 seeds)	57% (36 seeds)
Land:	land resource 5-15 acres	land resources 3 langdo to 5 acres	land resource 1 to 3 langdo
Food resources	Sufficiency in food grains	mostly sufficient food	insufficient food
Cattle	Enough cattle + other livestock	good number of local cattle	less cattle heads
Employment	Employment of other farmers		Dependent on seasonal/casual labour
Business	Income from off-farm contract work etc.	-	-
Other indicators	-	Irrigation problems	Dependent on minor forest produce
	-	-	Problems of crop damage through wild animals

Fig. 11 (b)

Poverty, or the absence of it, has a number of reasons, as the wealth/wellbeing ranking exercise amply demonstrates. Mainly it is of course tied to the availability of productive assets: in the case of Nahi Valley mainly of irrigated rice land. Already the loss of water, as in the case of Hali, can mean a change from a decent life to one at the brink of disaster. Cattle or, in a few cases, also machinery (such as rice mills, power tillers or oil crushers), are also means of social differentiation. A clear differentiation between rich and poor is either the ability to employ others, or on the other hand to have to work as a seasonal wage earner. Possibilities to work for others are either the better-off farmers in Nahi Valley and the local monasteries, or daily wage employment in Wangdi, which is mainly sought in winter-time.

7. Health and Education

Care for health and education are important to all farmers in the area. However, the case of health care is not unproblematic. As has been elaborated above (see section 5), institutions for health care are the local *lama* who carries out spiritual healing via *puja* rites, the village health worker in case of very minor problems, and the medical hospital in Wangdi, up to a half-day walk distant from the settlements. There seem to be a few older men who have knowledge of local plants and their utility for medical treatment, but this knowledge is usually not shared and not used for the treatment of others. The

knowledge of the general public regarding the medical properties of forest plants cannot be judged from the RRA due to conflicting information in the field, and should thus be looked into more carefully.

Midwives or traditional birth attendants are, according to a number of discussions, not found in the area⁷. There are only some persons who help pregnant women during their last weeks before giving birth with "pre-birth gymnastics", as one could describe it from an outside perspective.

Not surprisingly, the number of baby and child deaths is quite high, as discussions with women reveal.

Common diseases, according to the VHW, are diarrhea, colds, fevers (no malaria yet), and few cases of snake bites. Most of these diseases occur during the rainy season between June and September. To prevent more serious diseases and epidemics, a health worker usually comes from Wangdi once every month in order to give injections for infants and to look after pregnant women.

As was partially described above (see section 5), the local school offers possibilities for children to study up to class 4. For continuing education, children have to go either to Gazello, south of Nahi Valley (up to class 6) or to Wangdi (up to class 10).

At peak agricultural season, such as during transplanting time in June, children sometimes do not come to school, as they must help in the farm. This, however, is no wider-scale problem according to the principal. Rather, the high rate of children not sent to school - according to a 1995 census 55 out of 101 children of age 6 to 12 - is worrying to the teachers. The prevalence of not attending school is highest in the lower wealth/wellbeing classes: according to an estimate by all teachers, while these social groups make up about two-thirds of all inhabitants of Nahi Valley, they only make up one-third of the school children.

The school, which shall be transferred to a higher and more spacious part of Nahi gewog in about one or two years, is constructed well and is equipped with good teaching material. However, the teachers have, through a problem ranking exercise, established the priority problems which the school itself faces presently (Fig. 12).

Problem Priorities regarding the School as seen by the school teachers	
Lack of teachers' accomodation	24 %
No road access	21 %
No power supply	11 %
Poor classrooms	9 %
No girls' hostel	9 %
Unsuitable school location	7 %
Insufficient water supply	5 %
Insufficient furniture	5 %
Poor bridge	2 %

Fig. 12

⁷ This insight is in line with other recent reports on women and health in Bhutan, e.g. U. Wikan (1990): The situation of the girl child in Bhutan. Final Report to UNICEF. Thimphu.

A vision drawing exercise with the children of class III and IV of the school revealed interesting insights into the aspirations and hopes of these children (up to age 17) for their own future. The basic task given was to draw how they aspired their environment to look in about 20 years, which job they hoped to have realized by then, and how many children they would like to have.

Generally, the childrens' drawings (a total of about 55) show a Nahi Valley gewog which has found a connection to physical modernization. A road and a nice bridge over the river have been established, electricity lines abound, cars and trucks travel to and fro - in a few cases even airplanes attempt to land in the valley, shops have lined up, and the school itself has become bigger and very beautiful. It is important in this context to see that the drawings of class III children are still much more personalized and varied than those of class IV, which have a much stronger link to modernization. Partly drawings from a school book have been taken as a model to make their own drawings. This shows a clear modernization influence of the textbooks - an influence which might be further emphasized by the Indian teachers, who have Indian modernization models in mind when talking about the development of Nahi Valley ("unless farmers mechanize just like they have done in India, this place will not improve").

In contrast to this focus on physical infrastructure improvement, the natural environment, especially as it relates to farming, has received little attention. Agricultural fields are nowhere to be seen, the mountains and forests have in most cases been removed to a peripheral backdrop, and only a few fruit trees are shown in the gardens around the central school and shop area.

Improvements of basic needs such as water supply (taps) or health improvement (basic health unit) are shown in a few drawings, but only seldom receive major attention.

As far as personal aspirations are concerned, nearly every child mentions to want to become teacher. A few alternatives are *dasho* (high official administrator), doctor or, in two cases, forester or *lama*. The parental role model of farmer is nowhere mentioned, and, after asking about 70 children directly whether anyone would not like to become a well-earning farmer who would help to feed the nation in the future, still not taken up by anyone as desirable. It seems neither to fit a personal wish for modernization, nor is it highly valued religiously⁸.

Most children would like to have between 2 and 4 children only

8. Main Problems and Developmental Priorities

The problems facing farmers in Nahi Valley gewog as well as their priorities for development were clearly expressed in nearly all discussions as well as in a number of problem ranking exercises and in the final discussion with village representatives. Already the first discussion with the present and former *gups* of the gewog revealed a lacking road access as well as the problems with some of the irrigation channels (including the presently unrealized potential of enlarging the irrigation area) as main problems. While it has to be carefully kept in mind that the villagers' perception might to some degree have been focused on the road issue by previous discussions between the Forest Services Division and the local population on a forest road to be constructed in the Nahi FMU, it is nevertheless a fact that regardless of who was asked (male - female; poor - well-off), the desire for a road connection was nearly always mentioned. In the final discussion and problem ranking during the meeting with representatives of the gewog, this issue was again reflected in depth (see Fig. 13).

⁸ due to the farmers' having to kill animals - even if only small insects when ploughing etc.

To the problems mentioned in the final meeting should be added a problem of drinking water supply in a number of areas (e.g. Hali, Yesawom; broken-down supply in Yesagom, maybe due to lack of maintenance by farmers), which was mentioned in some smaller group discussions and problem ranking exercises. A problem which was not mentioned by the farmers themselves, but which the RRA team perceives on the basis of a number of indications, is: limited cooperation among the farmers in Nahi Valley.

Problem Ranking			
Problem	Illustration	Score	Final Rank
Insufficient irrigation water		14	II
Lack of road access		17	I
Problems of wild animals		8	IV
Unproductive cattle breed		4	VII
Lack of market access		4	VII
Insufficient health service		9	III
Irregular visit of forest personnel for fuelwood permits		7	V
Shortage of land access for poor		8	IV
Seasonal lack of food		5	VI
Pest + disease problems for fruit trees		4	VII
Registration of skoshing land		5	VI
Absence of electricity		8	IV
Problems of the present school infrastructure		7	V

Fig. 13

1. Lack of road access

As mentioned, the issue of road construction was initiated by the Forest Services Division which plans to construct a road along the Southern slope of the gewog, in order to be able to exploit the mixed broadleaf forest in the upper part of the watershed. The majority of the villagers, however (with the exception of inhabitants of Hali who would be

close to such a forest road) would rather see a municipal road connecting their settlements in the Northern part of the gewog (cf. map drawn by *gups* in Fig. 2, or a forest road which would first pass through these settlements. Arguments for such a road from the side of better-off farmers are mainly: better marketing possibilities for agricultural produce, especially if a road connection were combined with an improvement and enlargement of irrigation facilities. Poor farmers see positive aspects of a road connection in easier access to the labour market in Wangdi, and to a limited degree in being able to sell minor forest products there. All inhabitants including the teachers and the VHW would appreciate a road for easier access to health facilities. Due to these reasons, the *gewog* has already made a petition at the district level for the construction of the road. Villagers mention that they would be ready to contribute labour from each household for support in road construction. They also state that they would be ready to carry out minor maintenance; larger maintenance, however, would remain the responsibility of the government. Regarding the question of compensation for lost agricultural land through which the road were to pass, the *gewog* has apparently already signed a communal agreement stating that this would be regulated internally, and would not be expected from the government.

2. Insufficient irrigation water

The clear number two development problem - a number of farmers state that it is their number one problem, ranked higher than road access - is the irrigation issue. It has two aspects, as described above (see sections 2 and 3 above): on the one hand, there are water transport problems in at least two canals, which have led in the case of Hali already to a complete drying up and loss of agricultural production areas. On the other hand, plans for an enlargement of the irrigation area along the Northern slope (Yesagom-Yesawom-Habesa) have only partly been carried out.

The maintenance issue is of complex nature and cannot be fully revealed by the RRA: on the one hand it seems that the original construction of some canals - especially the Hali canal built by the military - was not optimal, as a sufficient water source was not captured, and as the canals showed construction weaknesses. On the other hand it seems that the water users' associations responsible for the canals only carry out minor maintenance like cleaning before the start of the season, whereas they rely upon the government to provide them with maintenance material, as they do not collect fees for this purpose.

Likewise, the issue of labour force in case of extended wetland through canal enlargement is not yet clear: while the (mainly better-off) farmers in the final meeting argued that labour shortage is not going to be a problem, other farmers mentioned this issue in earlier discussions.

3. Insufficient health service

The next important problem, i.e. that of health services, is actually quite clear and unchallenged. Suffice it to say that there are still two potential solutions to this problem: while on the one hand the provision of road access would at least solve problems for acute and more severe cases of illness, on the other hand the improvement of the services of local VHWs in terms of knowledge, skills and material might help to solve more widespread disease problems.

4. Crop damage by wild animals

This problem is quite widespread in most farms which are adjacent to the forest. As such farms tend to be with a higher likelihood dryland agriculture, it means that the poorer

section of society (which has less access to irrigated fields and is more dependent on dryland and tsering agriculture) is disproportionately higher affected. Two factors render an improvement difficult: on the one hand the buddhistic aversion against killing animals; and on the other the present forest act which forbids to kill wild animals except when they are directly on the field. The second problem might be overcome by a revision of the respective act.

5. Shortage of land access

The problem of land shortage, especially for poorer people, was mentioned both by poor farmers themselves and by some better-off residents speaking on behalf of the poor. When two factors which are presently hindering a better land access could be overcome, the situation of the poorer households in Nahi Valley might improve: one is presently unirrigated land which could be turned into productive fields by means of enlargement of canal irrigation (as actually foreseen; cf. Fig. 14). The other one is the problem that potentially productive land is lying idle in some areas of the gewog (e.g. in Nabesa and in Hali) due to absentee landownership. Another solution for poor families might be an improvement in seasonal or permanent labour - one factor why also poorer families are interested in improved road access.

6. Absence of electricity

As mentioned in the previous chapter on methods, the non-availability of electricity is presently not a problem - as alternatives for lighting, heating etc. are still available -, but rather an expressed desire. It is mostly voiced by better-off farm families, who are thinking about electricity in terms of providing light for productive activities in the evening.

7. Irregular visit of forest personnel

The problem of needing forest personnel to receive permits for firewood and construction timber collection was described above (section 4). It points to the more underlying problem, that the Forest Service is firstly insufficiently available, and secondly mostly acting as a policing, rather than a servicing and supporting, force. This problem could be overcome by a stronger direction towards social forestry and a more intensive presence of the respective personnel in the area.

8. Problems of the present school infrastructure

The relatively high scoring of this problem stems from the fact that all local teachers were present at the final meeting and gave high marks for this issue. Actually all related problems are treated extensively above (see section 7). Solutions to these problems might partially lie in the planned relocation of the school, partially they might be overcome through combined self-help efforts of teachers, pupils and parents, supported financially or technically from external sources.

Fig. 14

9. Seasonal lack of food:

As described intensively above (see sections 3, 4 and 6), the poorer section of the local society experiences more or less severe seasonal food shortages, especially between April and June. Solutions to this problem can be found, when the related problems of insufficient irrigation water, crop damage by wild animals, and lack of land access could be overcome.

10. Titling of sokshing land

The problem of uncertainty about the registration of sokshing land - forest land used for gathering leaf litter - was expressedly voiced in the final village meeting. It shows that the relation between the forest and the household farming system is an intensive one, which farmers fear might be destabilized if traditional rights might be overtaken by more intensive forest use through the Forest Service.

11. Unproductive cattle breed

As was discussed above (see section 2), there is only a very limited number of improved livestock in Nahi Valley. Furthermore, the extension service, as the institutional diagramme (Fig. 10) showed, is not very present in the area. Therefore some farmers expressed this as a problem, hoping that a way could be found to upgrade cattle and to improve veterinary services. With the establishment of the RNR training/service center, it can be hoped that this problem might be overcome in the near future.

12. Pest and disease problem for fruit trees

The pest and disease problem is to some degree caused by limited extension services (see also the problem: irregular visit of forest personnel). It could be overcome by stronger presence, as well as service orientation, of Forestry personnel, as well as by the RNR center which should be opened soon.

13. Lack of market access

This mentioned problem is actually almost identical to the problem of lack of road access. At this point it should only be differentiated that presently the Western-most inhabitants of the *gewog* are oriented to Thimphu - which they can easily reach by crossing the mountain ridge further West - rather than to Wangdi, because in Thimphu they can reach better prices for their products, and can avail of better services compared to Wangdi. Thus, an improved road access to Wangdi would not make much difference to them.

14. Insufficient drinking water supply

A number of areas, including the school, houses in Hali, and the settlements Yesagom and Yesawom, have problems in receiving sufficient drinking water. While there is not generally a lack of good quality water in the watershed, some taps or springs have in recent years fallen more dry. An additional problem is apparently that in at least one place (Yesagom) where farmers had a good water tank with pipe connections, lack of maintenance caused the tank to clog, whereupon farmers forcefully opened the pipes and thus destroyed the system. Therefore the solution to this might not so much lie in technicalities as also in an improvement of community spirit (see below).

15. Limited cooperation among the farmers in Nahi Valley

An externally perceived developmental problem whose solution is not yet clear is the limited form of cooperation of Nahi Valley farmers. Up to a certain degree this can be expected, due to the facts that first of all farmers do not live in one (or a few) village(s), but widely dispersed over a large area, and secondly that despite the small number of households, quite a high degree of social differentiation exists among them (see section 6). However, it is still surprising for an outsider to see and hear, that even with regard to such basic needs as drinking water supply, primary health care and education very limited community and self-help spirit exists. The same fact is as surprising with regard to the irrigation systems, where the existing associations seem to neither have fully mastered their most pressing problems - i.e. maintenance issues - nor tried to make better use of the full potential of water user associations (such as communal marketing or provision of inputs), due to the very limited degree of cooperation. This issue which could not be explored fully during the RRA, needs to be understood more completely, as any form of outside developmental support can only be supplemental to the self-help capacities of the local society.

Conclusions

1. Nahi Valley gewog is a municipality which is clearly marked by its watershed nature with the combination of forest and irrigated rice-land as the main natural resources. These resources are widely, and so far sustainably, utilized by the limited population. The farming system shows a combination of crop agricultural, animal husbandry and forest utilization. In fact, the forest plays a vital role not only as a provider of wood for a variety of purposes, but also because of its intensive utilization for grazing and thus indirectly as a provider of fertilizer for the fields in dryland agriculture. Finally, especially the poorer sector of the local society relies intensively on the forest as a provider of minor forest products in times of periodical food and income crisis.
2. In the natural resources sector, present problems of farmers are mostly related to irrigation. Part of this problem seems to stem from only limited organizational capacities or interests of the local population.
3. With regard to the forest, the interest in "classical" social or community forestry is presently low, as people can still easily avail of forest products. However, a need for improved extension with regard to tree management is still obvious. Additionally, some regulatory issues, such as the problem of fighting against wild animals, or registering sokshing land, are demanded. Should the Forest Service want to make intensive use of the productive forest in the FMU, clearly additional inquiries into issues such as sokshing use, animal grazing practices and use of minor forest products, as well as intensive discussions and planning stpes with the local population are mandatory.
4. The same goes for the issue of road construction, as this subject was the most widely expressed concern during the whole RRA. There is a potential conflict of interest between the Forest Services Division, who has planned to construct a road

on the Southern ridge and slopes of the Nahi Valley watershed, and the local public, who demands a road connection on the Northern side and is apparently ready to make their contributions to construction and maintenance of such a road. For reasons of public participation and harmonization of potential conflicts in the area, especially a clarification of the economic issue involved, regarding both alternatives, and taking into consideration a potential contribution from the public, is necessary. Based on such data, as well as on Environmental Impact Studies of both alternatives (e.g. alterations to the ecological system of mixed broadleaf forests; impacts on the irrigation facilities in Nahi Valley as well as Wangdi; relative increase in erosion; water pollution, etc.), a further discussion between the Ministry of Agriculture, the local public, the Dzongkhag administration and the BG-IFMP are necessary.

5. With regard to the social issues and the basic needs provision, the RRA has revealed a complexity of development problems in the area. For some of these problems potential solutions could be identified (see previous chapter, section 8) and/or can be overcome by improved service provision from the respective administration. For some issues it has to be studied whether apparent plans for improvement - such as the opening of the RNR center, or the transfer of the school - will actually be carried out in the foreseeable future, and in what manner. For other problems, the BG-IFMP might be able to offer assistance.
6. Any outside assistance, however, should be based on the willingness, interest and ability of the local population to cooperate and to make their own contributions. This is most crucial with regard to issues of maintenance of public infrastructure, as well as communal management of primary resources such as water and forest. As this was one of the perplexing issues of the RRA which could not entirely be understood (see previous chapter, section 8), further investigation and tests - e.g. concerning small improvement measures for public utilities (such as improved bridge construction near the present school) - should be carried out, before venturing on any larger measures of support in the fields of road access or irrigation management.