PARTICIPATORY RESOURCE PLANNING IN WETLANDS OF NEPAL A CASE STUDY OF GHODAGHODI TAL

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ABSTRACT

The paper aims to put forward systematic steps of doing participatory appraisal to prepare a community-centered management plan of Ghodaghodi Tal, an area of western Nepal. In order to achieve this goal, the paper has been divided into two parts. The first part begins with a panoramic overview of the socio-demographic scenario and forest situation in Nepal. According to the latest estimate, 54 % of the area is covered with vegetation. Forests cover about 37.4 % (5.5million ha.) of the total area. Grasslands and shrubs cover 12 % and 5% of the land respectively. The dependence of an 18.5m human population and a 17.2 m livestock population on forests is the main cause of deforestation and forest degradation in Nepal. Other causes include forest fires, infrastructural consequences, illicit trade and natural calamities. About eight types of indigenous and sponsored models of resource conservation have been presented. It was found that community forestry management is the most successful model of forest protection in Nepal. The number of FUGs that manage and control the community forests has reached about 6,574. The chronology of forest legislation development is also presented. Data show that about 53 % of Nepal's land is suitable for forestry and forest development. The second part attempts to show how a participatory assessment can be undertaken to prepare a community-centered plan for the sustainable management of a wetland in Nepal. The paper mentions that PRA (Participatory Rural Appraisal) is a learning process, which progresses through three stages: learning to be effective, learning to be efficient, and learning to disseminate. In other words, it is an approach of "learning by doing". The participatory assessment that combines a variety of simple but effective techniques of data collection is a nine-step process, which begins with concept development and terminates with the community's acceptance and endorsement of the plan. The study has been successful in developing the capacity of the local community to prepare a participatory management plan and enhance their feeling of ownership in the plan. Lessons distilled from the study show that people will cooperate with outsiders only when they are convinced that they will be the beneficiaries of the plan.

I. INTRODUCTION

The primary purpose of the paper is to talk about the process of a participatory preparation of a community-centered management plan of Ghodaghodi Tal area, a lake system in western Nepal, where deforestation and forest degradation are taking place alarmingly and rampantly. The paper has been divided into two

parts. The first part gives an overview of the forest situation in Nepal and briefly presents the major underlying causes of deforestation and forest degradation. The second part gives a brief introduction of PRA and discusses the systematic processes involved in the preparation of a community-centered management plan. Some outcomes and lessons learnt from this exercise are also presented.

II. OVERVIEW OF FORESTS IN NEPAL

1. Nepal at a Glance

Nepal is a tiny country wedged between the two largest countries in the Asian region, India to the South and the People's Republic of China to the North. It lies to the North of the Tropic of Cancer and shows a great climatic diversity. The country runs from east to west and covers an area of 147,181 sq. km. In terms of its size, it is 65 times smaller than the People's Republic of China and 22 times smaller than India. It is about 2.5 times smaller than Japan. Its length is about 885 km. and breadth varies from 145 to 240 km. It lies within the latitudes of 26˚22'N and 30˚ 27' N and longitudes of 80˚4' E to 88˚12' E.

Nepal is bordered in the North by China's autonomous region of Tibet, in the East by Sikkim and West Bengal states of India and in the South and West by Bihar and Uattar Pradesh (UP) states of India. It is a land-locked, mountainous country. The nearest sea port is Calcutta (India), which is 960 km away (Chaudhary, 1998).

Nepal is known by various names such as the country of Mt. Everest, or the country of Buddha's birthplace or the only Hindu country of the world. According to the Census of 1991, the population of Nepal is 18.5 million with an annual growth rate of 2.08 %. With this growth rate Nepal's population will double in 33.7 years. The total number of households is 3.4 million with an average households size of 5.6. The average population density is 125.6/sq. km. and the mean sex ratio is 99 (CBS, 1995).

Administratively, the country is divided into 75 districts with 3,913 village development committees (VDCs) and 58 municipalities including metropolitan and sub-metropolitan areas (HMG/NPC, 1992).

2. Status of Forests

Statistics show that one-fifth of Nepal's total area is cultivated and another 7 % can be brought under cultivation. Forests and shrubs together occupy 42 % of the total area of the country. Nearly 12 % of the area come under pastures. Snow, rocks and degraded lands are not suitable for farming and cover about 19% of the total area (CBS, 1998).

The data of 1991/1992 shows that 18 % of the total land was operated by farmers. Per capita agricultural land is 0.14 ha. The majority of arable land was used to grow seasonal crops (crops with an under-one-year growing cycle). Permanent crops occupied less than 2 % of the total agricultural land (Misra and Kayastha, 1998).

Physiographically, the country has been divided into 5 regions with two broad types of biogeographical realms: Indomalayan and Palearctic. The climatic zone, coverage and altitudinal variations are given in Table 1.

Table 1. Physiographic Zone, Climatic Zone, Area and Average Altitude

Physiographic Region	Climatic Zone	Area	Altitude (in m)
High Himal	Alpine Zone	23 %	4,000-5,500
High Mountain	Sub-alpine Zone	20 %	3,000-4,000
Mid Mountain	Temperate Zone	30 %	2,000-3,000
Siwaliks	Sub-tropical Zone	13 %	2,000-3,000
Terai	Tropical Zone	14 %	>1000

Hard wood forest consisting of sal (*Shorea obusta*), khair (*Acacia catechu*) and sisso (*Dalbergia sisso*) occupies about 59% of the total area of natural forest and is common in the Terai region. The soft wood conifer forest (pine and fir) type is found in the alpine and sub-alpine regions of high hills and mountains in the North. Evergreen, deciduous and mixed forests are common in lower hill ranges. In Nepal there are about 35 types of forests.

The Master Plan for the Forestry Sector Nepal (HMG / ADB / FINNIDA, 1988) reports that Nepal has approximately 54% of its total surface area under vegetation. The land use of physiographic regions by the vegetation category is given in table 2. According to the Table, 37 % (5.5 m ha) of the total area comes under forests which have at least 10 % crown cover. Grassland covers 12% (1.7 m ha) and includes degraded forest as well. About 5% (0.7 m ha) is under shrubs. The statistics shows that a total of 1.08 m holdings have forest tree plantation on their holdings with a national average of 31 trees per holding (see Table 2 for details).

Table 2. Land Use by Physiographic Region, 1985-86 ('000 ha)

Physiographic Region	Cultivated land	NCIS (a)	Grassland	Forested lands/forest plantation (b)	Shrub land/degraded forests(c)	Other lands	Total
High Himal	8	1	885	155	87	2,234	3,350
High Mountain	244	148	508	1,639	176	245	2,960
Mid Mountain	1,223	667	278	1,811	404	59	4,442
Siwaliks	269	59	16	1,438	29	75	1,886
Terai	1,308	123	58	475	30	116	2,110
Total	**3,052**	**998**	**1,745**	**5,518**	**706**	**2,729**	**14,748**
%	**21**	**7**	**12**	**37**	**5**	**18**	**100**

Source: HMG/ADB/FINNIDA (1988)

Note: (a) NCIS (non-cultivated inclusions), meaning small pockets of land close to cultivated lands, but too small to be mapped at a scale of 1:50,000. They are a distinct land use category.

(b) Forested land, meaning at least 10 % crown cover.

(c) Other is a catch-all category, which includes rocky areas, lakes, ponds, waterways and settlements.

The categories of lands usable for forestry according to physiographic regions are given in Table 3. Some 53 % of Nepal's land is suitable for forestry and forestation. Approximately 82 % of the land is suitable for forestry in the Siwalik region and 10 % in the High Mountain region.

Table 3. Land Suitable for Forestry Purposes ('000 ha)

Physiographic Region	Plantation	Shrub lands	Grasslands	NCI	Total	%
High Himal	155	67	109	1	332	10
High Mountain	1,639	176	364	104	2,283	77
Mid Mountain	1,811	404	281	601	3,097	70
Siwaliks	1,438	29	17	53	1,537	82
Terai	475	30	58	31	594	28
Nepal	**5,518**	**706**	**829**	**789**	**7,842**	**53**
%	**70**	**9**	**11**	**10**	**100**	

Note: Percentage across is for entire Nepal and percentage down, for total area of forests
Source: HMG/ADB/FINNIDA (1988)

3. Categories of Forest

From the management and utilization point of view, the forests of Nepal have been categorized as follows.

1). **Government-managed Forest**: The natural forests that are managed and controlled by His Majesty's Government come under this category. According to the Private Forest National Act of 1957, lands which are not cultivated belong to the government. The institution responsible for managing these state forests is the Department of Forests. The chronology of forest legislation in Nepal is given in Box A.

2). **Protected Forest**: The Forest Act of 1993 (Chapter 4 and Clause 23) suggests that forests that are unique from the points of environmental, scientific, and cultural significance are categorized as protected forest. National parks and reserves fall under this category.

3). **Community Forest**: Forests managed and controlled by indigenous as well as sponsored community groups are popularly known as community forests.

Box A: Chronology of Forest Legislation in Nepal

1934	Establishment of Ban Janch Adda
1956	Establishment of the Office of the Chief Conservator
1957	Private Forest National Act
1961	Forest Act
1967	Forest Protection (Special Amendment) Act
1970	Forest Products (Sale and Distribution) Rules
1976	National Forest Policy Act
1978	Panchayat Forest Rules
1978	Panchayat Protected Forest Rules
1978	Leasehold Forest Rules
1981	Private Forest Rules
1993	Forest Act
1995	Forest By-laws

Source: Various Sources

These forests are protected, managed and utilized by local user groups. These groups are called Forest User Groups (FUGs). In this type of management, local communities are given rights by the Department of Forests to manage and protect resources. FUGs receive benefits accruing from the forests. A community forestry program started in the early 70's has shown impressive results in meeting the demands of fuel wood and fodder. Joshi (1997) reports that resources can be protected and managed if communities are empowered. The organized communities are effective managers of resources. The statistics on FUGs, a total of 6,574 FUGs from 64 districts have already been formed. The Sindhu Palchowk district has 305 FUGs, which is the highest number, and the Kaski district has got 286 FUGs, which is the second most in the country. The total area covered by these FUGs is 440,622 ha. Some 701,508 households have joined the user groups.

4). **Leasehold Forest**: National forests handed over to any institutions, which are established under the current laws, are categorized as leasehold forests. There are many leasehold forests in Nepal.

5). **Religious Forest**: Religious forests are the forests handed over to religious trusts or groups for their development, conservation and utilization. Good examples of religious forest are Bajra Barahi forest and Guheswori forest.

6). **Conservation Area**: The areas managed in accordance with the bioregional planning concept for the conservation of the natural environment and their sustainable use are called conservation areas. The Annapurna Conservation Area Project (ACAP) and Kanchanjunga Conservation Area Project (KCAP) are good examples of a conservation area.

7). **Private Forest**: It refers to degraded or forested lands that are owned by individuals or organizations. It also includes the area under agro-forestry. The Department of Forests supplies saplings free of cost and provides technical support for the management of private forests. They can be managed for commercial purposes as well.

8). **Indigenous Method**

Shinga Naua: It was a common system among the Sherpas of eastern Nepal particularly in Solu-Khumbu district. The Shinga Naua was a locally appointed or elected official by the community for a fixed term. He was the caretaker of the forest with authority of allocating forest resources and ensuring that individuals adhere to informal rules and regulations. Presently this system does not exist in Solu-Khumbu. How deforestation and degradation occurred in the forest of Solu-Khumbu is well-quoted by Gilmour and Fisher (1991) below:

> .. "the replacement of this system (Shing Naua) by ineffective national Forest Department contributed to the degradation of forests in Solu-Khumbu"

In Sindhupalchowk district, Shinga Naua is responsible for protecting adjacent forests and regulating the uses of pasturelands.

Chitardar: The Chitardar system was common in the hills in the 19th century. A Chirardar was a local guard employed by the community to watch a particular piece of forest. He received a fixed amount of cash from each household. He was responsible for administering and controlling the use of village forest resources, which are primarily used as fuel wood, fodder, leaf litter, logging and building materials.

Manapathi System: This system is based on payment in kind, especially grain. Under this system, users contribute grains from each household for the payment of their forest watchman.

Kipat System: This system was common within a certain group of Limbuan communities in the Eastern Hill. They received the state's mandate to regulate and protect their forest in the Kipat land. This system does not exist any more.

Talukdar: In the Rana period, forests were managed through local officials. These officials were called Talukdars and collected land revenue from private landholders.

4. Underlying Causes of Forest Degradation

Before we understand the underlying causes of deforestation and forest degradation, it is necessary to understand their direct causes because direct causes and underlying factors are closely related to each other. They are not mutually exclusive and thus can not be examined in isolation (Stedman-Edwards, 1998). Experiences show that the following are the direct causes responsible for deforestation and forest degradation in the kingdom of Nepal.

1). **Over-grazing**: Forest and degraded forest areas are the principal grazing areas for millions of livestock in Nepal. A large number of animals grazing in small strips of land along the highway is a very common scene. Them total livestock population is 17.2 m, of which cattle account for 42 %. They must graze and browse in any strips of barren lands available.(Anonymous, 1993)

2). **Over-harvesting of resources**: The rural areas of Nepal depend on forest and forest resources for meeting their basic needs such as fuel wood, timber, fodder, medicinal herbs and food. About 91 % of the population live in rural areas and Nepal's population is increasing at the rate of 2.08 % annually. Their demand is increasing proportionally on forests and forest resources. Likewise the consumption of traditional and commercial sources of energy is estimated to be annually growing by 2.1 % and 3.6 % respectively. The total energy consumption is 7 m TOE (ton of oil equivalents). Fuel wood is estimated to make up 79.8 %, while agricultural and cattle residues are estimated to comprise 3.5% and 5.9% respectively (HMG, 1998). Also, rural people prune pollard and lop trees for fodder and other purposes. In addition they also go to forests to collect litter and forest products. Their timber requirements for construction is also met by forests. The attributed reason to over-harvesting is abject poverty. About 49 % of the total population is below the poverty line. The incidence of relative poverty is higher in rural areas than in urban areas (Anonymous, 1993).

3). **Forest fire**: Slash and burn cultivation and setting fire to the forests for new tender shoots and grasses is annually practiced in the spring and summer seasons of each year. Not only dose this cause damage to forests but it also affects their capacity to regenerate quickly and sometimes causes irreparable loss to these resources.

4). **Infrastructural consequences**: The development of roads and technologies is a bane to forests and forest resources in rural societies because they have aggravated the process of deforestation and forest deterioration. Trucks carry away more timbers and fuel woods from the forest area now than ever before. The constructions of big dams and reservoirs have exerted extraordinary pressures on forest and forest resources. Similar is the case with the establishment of high voltage transmission lines for electricity. In many places, these processes have brought negative changes in the forests and ecosystems, which can commonly be seen along the highway. Likewise, haphazard settlements along the road and at strategic points are major causes of forest degradation and deforestation.

5). **Natural calamities**: Natural calamities such as widespread pestilence, pollution, landslides, avalanche and storms are other causes of forest degradation and deforestation in Nepal. Small patches of forest areas damaged by avalanche and stormy winds are common in mountainous regions. Some of these calamities are the result of direct human intervention.

6). **Illicit trade of timber**: Trees good for timber are illicitly felled and sold. These phenomena are common in Nepal. This has posed a serious threat to forests

and forest resources.

7). **Free gift**: As mentioned elsewhere, forests belong to the government. This has two implications for local communities. One is their feeling that the forest does not belong to them and it is not their responsibility to protect them. As a result, local communities compete with each other for harvest. Secondly, people continue to think that forest resources are an inexhaustible, free natural gift. There is a feeling that outsiders will harvest these resources if they do not harvest them by themselves. Because of these reasons, deforestation and degradation are taking place in an alarming way.

III. PARTICIPATORY PLANNING PROCESS: A CASE FROM GHODAGHODI TAL

Participatory planning and management of natural resources can successfully be undertaken in conservation and management of forest resources if people are involved from the very outset i.e., from the initial phase of concept development to the reviewing and monitoring of program planning. This part suggests the process we adopted in involving local people in the preparation of a participatory management plan in the Ghodaghodi Tal area.

1. Selection of the Ghodaghodi Tal area

Ghodaghodi Tal is the largest wetland in the Terai region of Nepal. It is situated at an altitude of 205 meters from the sea level. Its latitude and longitude are 28˚ 42' 06.6"N and 80˚56' 44. 0" E respectively. It lies along the Mahendra Highway with several ramifications caused by soil erosion and running water. It covers a net area of 138 ha within a catchment area of 825 sq. km (Bhandari, 1998). Ghodghodi Tal along with other lakes at its catchment area was selected on the bases of the following criteria (IUCN Nepal, 1998).

1). The Tal area is a habitat for such protected wildlife of Nepal as the marsh mugger, endangered golden monitor lizard, Indian python and tortoise. The Tal area also houses common otter and indigenous species of fish. A large species of tortoise is also reported to be present in this area.

2). About 140 species of birds, both migrant and resident, representing over 16 % of national avifauna have been reported in the area. A few birds that breed in north Asia are also reported to reside here. But the destruction and deterioration of the surrounding forest area have threatened their presence.

3). The Tal area is the largest inter-connected natural lake system in the Terai of Nepal. The other lakes connected with Ghodaghodi Tal are Nakhrodi Tal, Baishhawa, Ojhuwa, Chidiya Tal, Budhi Nakhrodi, Sunpokhari, and Ramphal.

4). The Tal is vulnerable and is exposed to tremendous anthropogenic activities. Because of this the Tal has always been in the top priority of

IUCN Nepal's Wetlands and Heritage Unit. Likewise HMG has also listed it as a critical wetland habitat.

5). The Tal area has been proposed by the Department of National Parks and Wildlife Conservation for its inclusion in the List of Wetlands of International Importance (or Ramsar Site under the Convention terms).

6). Due to its strategic location between Royal Bardia National Park and Royal Suklaphanta Wildlife Reserve, it provides tremendous opportunities for developing ecotourism in the area, thereby generating income for local communities.

7). Since the Tal area is close to the Mahendra Highway it is easily accessible to outsiders throughout the year and has religio-cultural significance as well.

2. Participatory Assessment

It is widely accepted that wise and sustainable utilization of resources is possible only when people are aware of a plan and ownership rights are given to them. The participatory process facilitates and ensures their full support in the successful implementation of the program.

PRA (Participatory Rural Appraisal) is a kind of learning process, where a new project should progress through three development stages: successively, learning to be effective, learning to be efficient and learning to disseminate. It puts emphasis on "learning" as a central part of the process and is based on the "learning by doing" approach. Another name for it is "action research" (Gilmour and Fisher, 1991). Participatory assessment should be seen as a continuous and routine process occurring in a community until the people feel confident to handle it by themselves. This participatory methodology we have used here comes under many names such as participatory inquiry, PRA, Rapid Rural Appraisal (RRA), action research, etc. This system is based on principles of multiple perspectives, group inquiry, context specificity and flexibility (Satterthwaite, et al, 1996; Khon Kaen University, 1987). It uses a range of methods, which can be grouped under four general categories:

1). Group and team dynamics (discussion, meetings and workshops)

2). Representative sampling methods

3). Interviewing and dialogue

4). Visualization and diagramming

The underlying principles of PRA are optimal ignorance (collection of necessary data and information only) and triangulation (verifying information from more than 2 sources). PRA is interactive, innovative, iterative, informal, in-the-community and interdisciplinary (Khon Kaen University, 1987).

3. Steps of Preparing a Participatory Plan

The participatory assessment that has been mentioned here consists of a series

of steps from the very development of a concept to community acceptance and approval of a community management plan. A summary of activities that took place in Ghodaghodi Tal, while preparing a community-centered management plan is given below.

1). **Concept Development**: A concept proposal was developed about preparing a management plan for the study area. That was the beginning of a participatory process. Major activities included:

- ❑ Collection of secondary data and information
- ❑ Review of literature
- ❑ Discussion with relevant experts
- ❑ Identification of a problem
- ❑ Preparation of a pre-proposal
- ❑ Development of a full proposal

2). **Rapid Reconnaissance Visit of the Area**: A team of experts made a quick and rapid visit of the area mainly to establish an initial contact with local communities. Other activities were undertaken to collect first-hand information and were designed to give direct exposure to the team about the real life situation of the area. The task of this visit was to perform the following activities.

- ❑ Visit to the site with local people
- ❑ Meeting local leaders and teachers
- ❑ Initiating dialogue with local stakeholders
- ❑ Revision of a conceptual framework

3). **Confidence Building**: Obtaining the confidence of local people was the main purpose of this step. Community people did not want to disagree with what had been said but would remain alienated from the project. To avoid this situation, methods of developing rapport with communities and building their confidence was initiated in the area. They are:

- ❑ Training of key people, leaders and motivators
- ❑ Discussion with communities and direct observation of sites
- ❑ Providing awareness to the community
- ❑ Initiating field activities
- ❑ Establishing direct contact with people
- ❑ Involving schools in conservation education
- ❑ Recruitment of local staff including a field coordinator

4). **Formation of a Local Steering Committee**: A local coordination committee was formed basically to ensure people's active cooperation and participation in the preparation and implementation of the plan. This committee while preparing the work plan, concentrated on activities related to 6Ws (what, why, when, who, where and how).

- ❑ Set up a contact at grassroots level
- ❑ Preparation of a work plan
- ❑ Identification of major issues and problems
- ❑ Consultation with grassroots people
- ❑ Division of task and responsibility
- ❑ Coordination at local as well as at district levels

5). **Development of a Research Strategy**: Being effective and reliable is one of the important components of a participatory assessment. It can be achieved only when we have the right time, at the right place, with the right person and use the right methods. The following activities were included.

- ❑ Preparation of maps (social, ethnic, and household)
- ❑ Locations of strategic places
- ❑ Identification of key-informants, respondents, etc.
- ❑ Preparation of a work calendar, meetings, discussion, etc.

6). **Information Gathering**: Although information gathering began with the preparation of a concept paper, collecting further information and validating information was done at this stage. Each day began with a preview of the day's activities and ended with a review or the day's activities and then planning for the next day. Activities undertaken at this step are given below.

- ❑ Preview of day's activities
- ❑ Sharing of experience in the evening
- ❑ Review of the activities
- ❑ Preparation of draft by each member
- ❑ Planning for the next day

7). **Appraisal and Analysis**: This step was basically devoted to analyze the situation and assess needs and requirements of the communities to undertake conservation activities. This helped revise and review more issues on the conservation of lakes and their resources. Major activities were:

- ❑ Conducting intensive consultation with the people
- ❑ Verification of facts and figures
- ❑ Understanding the dynamic relationships between different variables

- ❑ Interpretation of data and information
- ❑ Screening of irrelevant information

8). **Preparation of a Draft Plan**: The draft plan was collectively developed with community leaders and members of the steering committee. A series of meetings, discussions, and brainstorming sessions were organized to analyze information. Major activities included:

- ❑ Development of an outline
- ❑ Filling in the information
- ❑ Organizing intensive discussions
- ❑ Review and revision of the report

9). **Community Endorsement**: This is the last part of the exercise we conducted in the country. Its main purpose was to obtain the people's endorsement and approval of the plan. It was a rather difficult part but was successfully done with the active support and cooperation of the communities. Major activities included:

- ❑ Notice circulation in public places
- ❑ Review and discussion in hearing of the public
- ❑ Incorporating suggestions and inputs
- ❑ Obtaining community approval and endorsement
- ❑ Dissemination of plans and activities

IV. CONCLUSION

A cursory review of forest-related literature indicates that there are tremendous pressures on forests and forest resources in Nepal. These pressures are mainly anthropogenic in nature and emanate from a growing human and livestock population. It is, therefore, important to mitigate them. Our plans and policies should address these issues. Many models that are in use show that efforts are underway to protect and conserve them. However, the community forestry program undertaken by the Ministry of Forests and Soil Conservation (MFSC) was most successful in terms of management and sustainable utilization. This model focuses on participatory management in partnership with users. The principal objective of the study is to prepare a community-centered management plan in collaboration with local communities using participatory assessment techniques. Activities such as consultation with local communities, awareness raising, training motivators and establishing a steering committee show that people have developed a sense of accomplishments and realize the importance of their participation in the decision making process. The local grassroots level organizations and local communities have given their support and commitment to conserve Ghodaghodi Tal and its resources. Several district-level organizations

have shown their interests to set aside some funds for its conservation. The most important of thing that we achieved was the acceptance by the communities of their ownership of the plan and the development of a capacity to prepare similar plans in the communities. The lessons we have learnt from this exercise are summarized below:

- ❑ People will cooperate only when their felt-needs are addressed.
- ❑ Consult as many stakeholders as possible. Contacting them initially saves a lot of time, resources and energy.
- ❑ Establish harmony with local communities. There is no correct way to establish harmony with local communities.
- ❑ People participate only when they are going to be the direct beneficiaries. Link people's felt needs to forest conservation.
- ❑ Identify informal leaders and establish contact with them.
- ❑ Emphasize both process as well as product.

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