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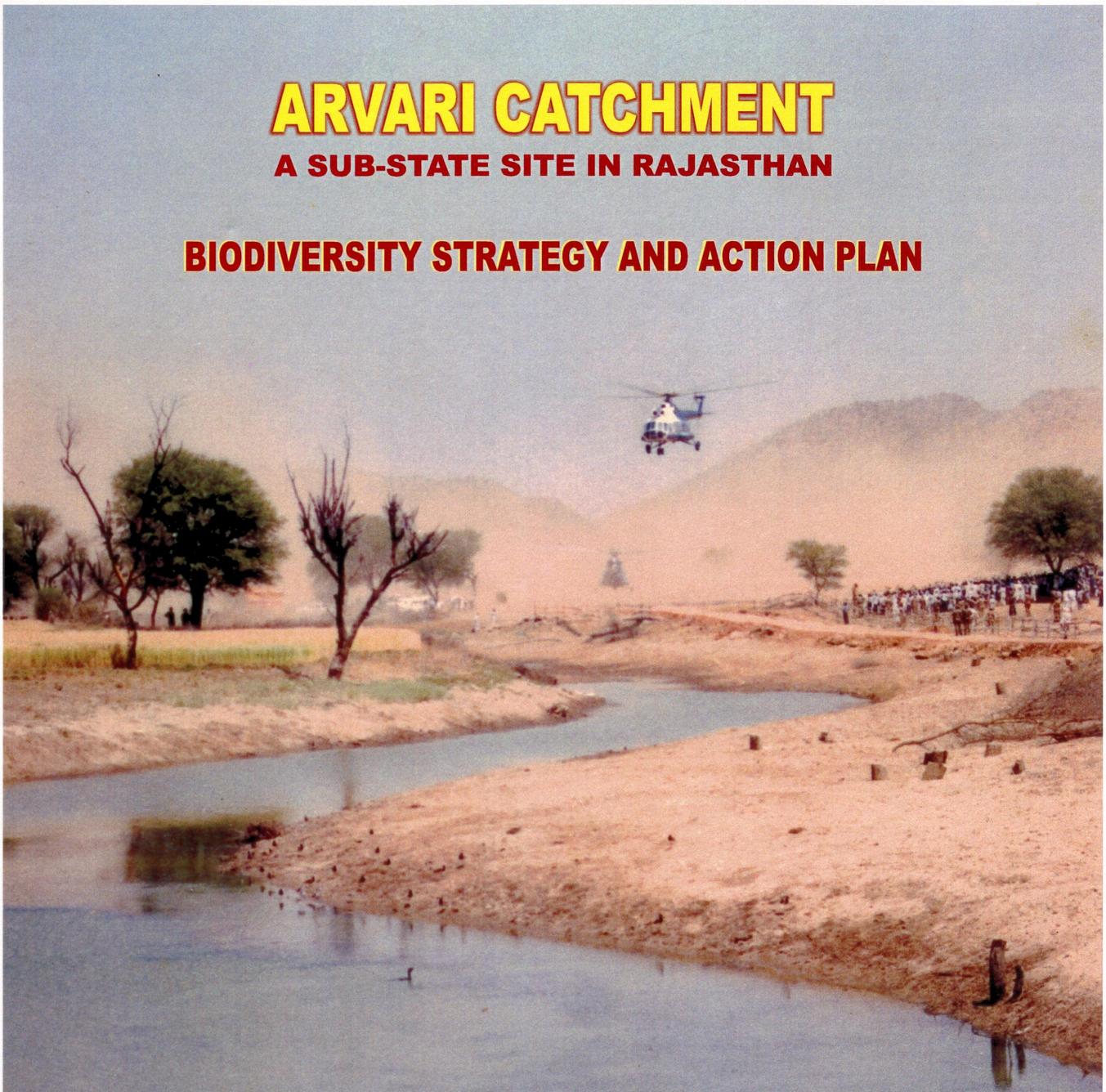
ARVARI CATCHMENT

A SUB-STATE SITE IN RAJASTHAN

BIODIVERSITY STRATEGY AND ACTION PLAN



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Preface and Acknowledgements

The catchment of river *Arvari* is situated in *Alwar* district of *Rajasthan* and is receiving less than 600mm rainfall annually. Once, River *Arvari* used to flow perennially but with the continuous existing drought conditions and due to depletion of Ground Water, it dried up and the whole *Thanagazi* block was declared as " Dark Zone" in Government records. Village community along with a local NGO, *Tarun Bharat Sangh* (TBS) have built around 250 rainwater-harvesting structures in 72 villages in the *Arvari* catchment over the last 20 years. These structures have replenished ground water and increased the water table of the wells enabling the *Arvari* back to life and make it flow most part of the year. Some factors like development of modern practices in agriculture, marble mining etc. have adversely affected the natural biodiversity of the area. Under NBSAP project, *Arvari* catchment has been included as sub-state site of *Rajasthan*. Information about the present status of biodiversity of the area, factors causing its deterioration, problems / successful community initiatives for regeneration of forest resources and revival of wildlife and social and cultural values for biodiversity conservation by the people and possible suggestions for conservation and improvement was collected from different sections of the society and also compiled information from existing literature relevant to the area and assessed the role of major stakeholders. On-going initiatives and achievements have been highlighted in the document.

This BSAP draft is an outcome of a collective effort in which a large number of people have contributed significantly. The community people of the *Arvari* catchment were the basic group who provided the necessary information that has been made the basis of this draft. This document contains 11 chapters, a detailed map of *Arvari* Watershed, 11 annexure, seven tables, eight boxes and 23 photographs & illustrations.

I am highly grateful to members of village community, Women's groups, *Arvari Sansad*, PRIs, TBS volunteers, school teachers, forest officials, *gram sabha* of *Bhaonta – Koylala* for providing the relevant information and their perceptions related to various aspects of the biodiversity of the area.

Besides this primary group of contributors, I wish to record our special thanks to:

- *Shri Rajendra Singh*, General Secretary of TBS who assigned me this task and provided all support and guidance in the organisation.
- *Shri V. D. Sharma* (Retired PCCF, Govt. of *Rajasthan*), Coordinator of *Aravalli* Eco-region who took special interest and gave his critical comments and suggestions during the preparation of the draft.
- *Shri Tejveer Singh*, Project Director, *Sariska Tiger Reserve* and LAC member who extended all help during the entire process of BSAP draft preparation.
- *Prof. M.S. Rathore* (IDS, *Jaipur*), *Dr. Sudhakar Mishra*, (Scientist), *Dr. (Mrs.) Kanchan Mathur* (Director, WRC, RIPA), *Ms. Maneesha Rai* (Project manager, BSAP *Rajasthan*), *Ms. Kanchi Kohli* of *Kalpavriksh*, *Dr. Lalit Kishore* (Educationist) and *Shri Sudhir Upadhyay* (both from *CULP, Jaipur*) and *Shri Ambuj Kishore (*CAPART, New Delhi, presently with TBS) with whom we had several discussions, which proved very useful.

I record my gratitude to *Dr. Satish K. Sharma* (Wildlife specialist), *Dr. Rakesh K. Srivastava,* (Sacred Grove expert), *Shri Kanhaiya Lal Gurjar* (Convenor, *Arvari Sansad*), *Shri Virendra Singh* (HM, Govt. Upp. Primary school, *Padak – Chhapali* and member *Arvari Sansad*), *Ms. Bhagirthi Rathore (TBS)* who joined field survey team and without whose active support, the fieldwork would not have been possible.

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Dr. Om Prakash Kulhari

Abbreviations and Acronyms

CBD	=	Convention on Biological Diversity
CEE	=	Center for Environment Education
CBO(s)	=	Community Based Organisation (s)
CSE	=	Center for Science and Environment
CULP	=	Center for Unfolding Learning Potentials
DST	=	Department of Science and Technology
EWG	=	Eco-Working Group
FD	=	Forest Department
FGD	=	Focussed Group Discussion
FRI	=	Forest Research Institute
GES	=	Global Information System
GOI	=	Government of India
IDS	=	Institute of Development Studies
JFM	=	Joint Forest Management
LAC	=	Local Advisory Committee
MoEF	=	Ministry of Environment and Forest
NABARD	=	National Agriculture Bank for Reconstruction and Development
NBSAP	=	National Biodiversity Strategy and Action Plan
NGO(s)	=	Non Government Organization (s)
NRM	=	National Resource Management
NTFP	=	Non-Timber Forest Produce
OECF	=	Overseas Economic Cooperation Fund
PRA	=	Participatory Rural Appraisal
PRI(s)	=	Panchayat Raj Institution(s)
SC	=	Scheduled Caste
ST	=	Scheduled Tribe
TBS	=	Tarun Bharat Sangh
UN	=	United Nations
VFPC (s)	=	Village Forest Protection Committee(s)
VFPMC(s)	=	Village Forest Protection and Management Committee (s)
WII	=	Wild Life Institute of India

Glossary of Local Terms

Adhyaksha	=	Chair Person
Amavasya	=	Moon less night
Arvari Sansad	=	People's Parliament of *Arvari* Catchment
Bir	=	Grassland for fodder grass
Bundhs	=	Check Dams
Dev Bani	=	Sacred grove dedicated to local diety
Dharadi Pratha	=	A traditional system of protecting a particular plant of animal species by a caste or clan.
Gram Panchayat	=	An elected body for local self-governance at village level
Gram Sabha	=	A village body of all adult members whose names appear in the voter list
Johad	=	A small village earthen water pond
Kakad Bani	=	Forest on the common geographical boundary of two or three villages
Kharif	=	Agricultural crops cultivated during monsoon
Lok Samiti (s)	=	Village People's Committee(s)
Mahila Mandals	=	Women organisations
Mukhia	=	Community chief
Padyatra	=	Foot March
Panch	=	Elected person in a *gram panchayat*
Panchayat Samiti	=	A cluster of *gram panchayats*
Pradhan	=	An elected head of *Panchayat Samiti*
Rabi	=	Agricultural crops cultivated during winter
Rakhat Basic	=	Forest belonged to a single villages independently.
Rundh or Balbani	=	A private forest protected by a landlord / jagirdar.
Sarpanch	=	An elected head of *Gram Panchayat*
Satyagrah	=	People's Non-Violent Movement
Thekka	=	Contract

Executive Summary

Introduction

All life on the earth is part of one great, interdependent system, which interacts with and depends upon the physical and biological components of the environment. Biodiversity is the source of all living material used as food, shelter, clothing, biomass energy and medicaments used by human beings. Human being is benefited from other organisms in many ways, some of which they don't appreciate until a particular species or community disappear. Even seemingly, obscure and insignificant organisms can play irreplaceable role in ecological systems or be the source of genes or drugs that some day may be indispensable.

Our stakes in biodiversity are very high since India's economy is based on agriculture, animal husbandry, forestry and fisheries. In 1992, the UN conference on Environment & Development adopted a Global Convention on Biodiversity (CDB) to conserve biodiversity by all nations. A number of countries including India have ratified the CDB. To implement the provisions of the CDB, the Government of India initiated the process of preparation of National Biodiversity Strategy and Action Plan (NBSAP). It is being carried out at 5 different levels; local (sub-state), State / Union territory, Eco-region (inter-state), thematic and national. Arvari catchment is a sub-state site of *Rajasthan*.

This document describes the present status of the biodiversity of the Arvari catchment spread over about 72 villages of *Thanagazi* block (*Alwar*) and *Jamuwa Ramgarh* block (*Jaipur*) in *Rajasthan* covering an area of 503 sq. km and identify the factors causing deterioration of the biodiversity as per the assessment of the local communities, forest department officials, scientists, social scientists, development experts and investigating team and it includes suggestions for its conservation and improvement.

A Local Advisory Committee (LAC) consisting of 15 members drawn from different sections of the society was constituted for collection of basic information and preparation of Strategy and Action Plan. A number of meetings were organised at different places. In these meetings, besides the members of the LAC, knowledgeable local individuals, scientists working on the biodiversity related issues, local NGO, villagers, members of women's groups and *Arvari Sansad*, *panches* and *sarpanches* of local *gram panchayats* and local forest officials were invited to participate. Information about the present status of biodiversity in the region, problems faced by the people and

possible suggestions for conservation and improvement of the biodiversity was collected in questionnaires specially designed for the purpose. A Field Survey team of nine members including local NGO field workers, knowledgeable local individuals, schoolteachers, employees of forest department, representatives of *Arvari Sansad*, experts of biodiversity (including field botanists and wildlife experts) and their services were taken for collection of information in the questionnaire. Detailed information was collected from 15 villages. Three villages, selected for case studies were *Bhaonta – Koylala* where community initiatives made success in conserving biodiversity in the region, *Samara* is a typical successful example of rejuvenation of forest through community efforts and *Kalsi – Jhiri ka Guwada*, a village suffering from excessive marble mining.

Dr. Satish Kumar Sharma, wildlife expert and official of forest department has done compilation of the published and unpublished research work available on the wildlife related to the area and *Mr. Ambuj Kishore* extending his assistance in the compilation of the literature from media. Subject experts and social scientists of forestry, wildlife, animal husbandry, agriculture, watershed, and medicinal plants were consulted to have technical details about different sectors of biodiversity.

Profile of *Arvari* Sub-State

Arvari catchment lies in the *Thanagazi* block of *Alwar* district and partly in *Jamuwa Ramgarh* block of *Jaipur* district in northeast part of *Rajasthan. This* area is receiving less than 600mm rainfall annually. Once, River *Arvari* used to flow perennially but with the continuous existing drought conditions and due to depletion of Ground Water, it dried up and the whole Thanagazi block was declared as " Dark Zone" in Government records. Village community along with a local NGO, *Tarun Bharat Sangh* (TBS) have built around 250 rainwater-harvesting structures in 72 villages in the *Arvari* catchment over the last 20 years. These structures have replenished ground water and increased the water table of the wells enabling the *Arvari* back to life and make it flow most part of the year. The rivulet, *Arvari* originates in the *Thanagazi* and terminates into a big water reservoir *Sainthal Sagar,* built by erstwhile *Jaipur* State in 1898 and its catchment area covers 72 villages of both the blocks in *Alwar* and *Jaipur* districts. The total area of *Arvari* catchment is about 503 sq. km. The length of the rivulet is 45 km. The area may be divided into two parts, hilly tracts and plains. The well-known *Sariska Tiger Reserve* is adjacent to the *Arvari* catchment and another important protected area in *Jaipur* district is *Jamuwa Ranmgarh* Wildlife Sanctuary, which is adjacent to the *Arvari*

region on the southern side. Both protected areas have rich biodiversity. Thus, *Arvari* region becomes important for biodiversity conservation.

Mean relative humidity during rainy weather is 63% while average annual rainfall is around 620 mm. 90% of the rainfall occurs during monsoon months (July to September). The occurrence of erratic rainfall is a common feature.

Four major communities namely *Gurjars, Meena, Balais and Rajputs* are prominent in this region. The hamlets of *Gurjar* community are found in the hilly tracts because of their main occupation being animal husbandry. *Meena* is a scheduled tribe community and is primarily engaged in agriculture. The area belongs to two constituencies of State Legislative Assembly and two tehsils viz. *Thanagazi* in *Alwar* district and *Jamuwa Ramgarh* in *Jaipur* district. The vegetation of the area is generally characterized as thorny scrub and sub-tropical deciduous forests. There are mainly two types of ecosystems, one natural forest ecosystem and second agriculture ecosystem. These ecosystems have been considerably affected by the biotic factors. The natural forests are now, in different stages of degradation. A number of plant and wild animal species are declining whereas some new plants species are coming up. In agricultural fields, changes have taken place in the cropping pattern and water uses. Irrigation facilities are limited. In most areas, generally two crops – *Kharif* during monsoon season is raised under rain fed conditions; *Rabi* crops are grown where irrigation facility is available. *Bajra, Maize, Jawar, Groundnut, Sesame, Kali Jiri* and some pulses like *Mung* are the major *Kharif* crops. In *Rabi* crop, *Wheat, Mustard and Gram (Channa*) cultivation is a common practice in irrigated lands throughout the area but Tara-Mira (*Eruca sativa*) Barley and Gram are also grown in rain fed areas. Several hybrid varieties of Wheat are also grown. Vegetables like *Bhindi* (Lady's finger), *Gajar* (Carrot), *Muli* (Raddish), Brinjal, Tomato, Chillies, Cabbage, Cauliflower, *Kaddu*, *Kakree, Batatas*, Watermelon etc. are extensively cultivated in places where the irrigation facilities are available. Increased use of chemical fertilizers, high yielding varieties of crop seeds and use of insecticides and fungicides is being practised.

The colonial records (Imperial Gazetteer 1908) shows the area well wooded and well managed in the past. About 12% of *Alwar's* land area was covered with forest. Total forest products yielded a sizeable income for the State with bamboos listed as a particularly important product for the State. In addition to forests, numerous grasslands and woodlands were under State ownership and control, though these were often opened up for village use after State's needs had been met. After independence of the country, the control of *Panchayats* slackened particularly during the famine years in early

fifties. In the mid 1980s, the area of *Alwar* district presented a near desertified landscape. Agricultural productivity was low, causing out-migration. The hillsides of the area were largely devoid of forest cover and severe soil erosion aggravated agricultural problems and degradation of natural vegetation. Further, the Central Ground Water Board determined that extraction of ground water in the area was greater than the recharge potential and the area was thus classified as a "Dark Zone".

The disintegration of the water harvesting system becomes significant in view of its central role and its re-establishment has played an important role in the environmental recovery in the *Arvari* basin. TBS activists feel that the decline in agricultural conditions was rooted in the state of decay of water harvesting structures. They hold that the loss of local control over natural resources was responsible for this. Similarly, forest cover and quality are believed to have declined as the state established control over forests and communities no longer felt a sense of ownership nor responsibility towards safeguarding these resources. Non-local agents of deforestation and mining operations, which enjoyed protection from the state, caused degradation in their own height and further alienated the local populace from their resource base. In nineties, with the introduction of the concept of JFM and launching of European Union supported *Aravalli* project, the forest have been re-established to some extent.

In 1986, the villagers *of Bhaonta – Koylala* built a huge *anicut* to catch the gush of rainwater from the surrounding hill-slopes from where the rivulet *Arvari* originates. This structure injected life into the rivulet *Arvari* by conserving rainwater. Since 1986, about 250 water harvesting structures have come up in 72 villages in the *Arvari* watershed for which community contributed about 33 percent of the total cost. These structures were collectively recharging ground water as was noticeable in the water table of the wells. This brought economic and ecological regeneration in *Alwar* district and a community owned system of natural resource management was evolved.

About 250 water bodies in the form of small and medium size anicuts, mud ponds (johad) and big reservoirs like *Jabbar Sagar* of *Hamirpur* village and *Sainth*al *Sagar* are now spread all over the *Arvari* basin. Some of these water bodies form wetlands of the area and they are quite rich in biodiversity and support a number of species of plants and animals of aquatic habitat. The livelihood of several people of the area is dependent on *Sainthal Sagar*, they take good *Rabi* crop in the catchment area and cultivate as cash crops. It supports a large population of Flamingos and other migratory birds. Some of these water bodies are under severe pressure in the marble mining area.

Current (known) Range and Status of Biodiversity

Arvari basin has mainly three types of ecosystems and ecological niches viz. Forest ecosystem, Agriculture ecosystem and Aquatic ecosystem. As per classification of forest types, by *Champion* and *Seth* (1968), the forests of this region have three main categories: *Anogeissus pendula* forests; Northern Dry Mixed Deciduous Forests and Desert thorn Forests.

The *Arvari* basin is located adjacent to the two protected areas viz., *Sariska* Tiger Reserve and *Jamuwa Ramgarh* Wildlife Sanctuary. Due to this reason also, the *Arvari* area becomes important for biodiversity. It also supports a large variety of wild animals like *Neelgai, Sambhar, Chittal*, Indian wild Boar, Indian porcupine, Indian Hare, Grew musk Shrew, Long-eared Hedgehog, Grey *Langur*, Rhesus Macaque (*Bander*), Leopard, Jungle Cat, Caracal (Syahgoh), Small Indian Civet, Small Indian Mongoose, Ruddy Mongoose, Grey Mongoose, Wolf, Jackal, Indian Fox, several species of snakes and local migratory birds. Species like Leopard, Caracal, Ruddy Mongoose, Wolf, Indian Fox, Stripped Hyena and Indian Wild Boar are rarely seen.

The successful community efforts such as *Bhaonta – Koylala, Chaunshala – Padak – Chhapali and Samara* have regenerated forest resources and revived wildlife in the area. The village common grazing land and some fallow lands in the past supported good growth of a number of palatable grass species such as *Cenchrus biflorus, C.ciliaris, Acrachne racemosa, Desmostachya bipinnata, Apluda mutica, several species of Aristida , Eragrostis, Digitaria* etc. Other important species in these lands are *Dactyloctenium aegyptium, D. aristatum, Heteropogon contortus, Sorghum halepense, Saccharium benghalense, S. spontaneum* and *Sehima nervosum*. As a result of past mismanagements, these lands are now either getting infested with thick stands of *Prosopis chilensis* or unpalatable weeds and grasses. Some sacred groves are having rich biodiversity and local people take care to protect some plant species. The productive potential of these lands is good and their proper management can improve them.

The major *Kharif* crops of the area are *Bajra, Maize, Jawar,* and pulses such as *Mung*, Oil yielding crop Sesame. *Kali jiri* is grown as cash crop in *Thanagazi* block and *moongphali* (groundnut) is grown in sandy plains of *Jamuwa Ramgarh* block. In *Rabi* crops, Wheat, Barley, Gram and Mustard are commonly grown. In the region, local farmers created and perpetuated gene pools by natural selection. The '*Jhakharana*' variety of *Bajra* (pearl millet) and *Dholi*, *Sathi* varieties of Maize, *Safed Lal* variety of *Jawar* is being perpetuated through natural selection. *Deshi* (indigenous) varieties of Wheat are still grown in the areas where adequate irrigation facilities are not available.

The farmers prefer to grow local varieties of cereals for their family consumption because of their good taste. A number of new improved and high yielding varieties of seeds developed for agriculture crops have been introduced in the area also. Introduction of these varieties substantially increased the productivity of crops. To maintain the productivity of the soil, the farmers have to put in chemical fertilizers as well as farmyard manure in good quantity. The use of chemical fertilizers, pesticides / insecticides is increasing which is causing adverse effect on soil micro flora and fauna. This is resulting into degradation of the natural fertility of the land.

In some part of the *Arvari* basin, some species of fruit plants are grown such as Mango, *Amrood, Aonwla, Papaya and Nimbu*, which are having good food and economic value. Some cultivators have started commercial cultivation of fruit plants like *Aonwla and Nimbu*. Common domestic animals are buffaloes, cows, goats, sheep, camel and they make a major contribution in the economy of the people of the area. They not only provide drought power but also valuable manure for the agricultural fields and food for the people in the form of milk, milk products and meat. Dead animals provide skins and hides. People of the area generally maintain large number of cattle. The important breeds of cows are *Haryana* and *Mewati. Murrah* and *Surti* are amongst the good breeds of buffaloes. All people of the area rear goats, because of their hardiness and low maintenance costs. Important breed of the goat is *'Jakharna'*. This breed is found in *Jakharna* village of *Alwar* district. Sheep and wool make substantial contribution to the economy of the people. Some good breeds of sheep reared in the area are *Chokla, Nali and Malpura*. Generally, local breed of birds, *deshi-murghi* are reared by poor sections of the society for their own consumption.

Statement of Problems related to Biodiversity

Main reasons for the loss of biodiversity in the forest areas are: biotic pressures, increased population and expansion of human habitations, excessive cutting of trees for fuel wood and furniture making and uncontrolled grazing by cattle adversely effecting natural regeneration of plants, deterioration of traditional social systems and cultural values for protection of sacred groves (*Orans*) and totem trees, politicization of *gram panchayats*, unscientific marble mining and introduction of exotic species. The wild animals have been suffering because of hunting and degradation of natural habitats. Unrestricted use of pesticides in agricultural crops is causing deaths of natural predators of agricultural pests. In recent years, increasing population of *Nilgai* (blue bull), is causing heavy damage to the crops of the villagers and alarming expansion of *Prosopis*

chilensis is reducing growth of herbaceous species and adversely effecting the growth of indigenous species.

The production of indigenous / local varieties of agricultural crops has suffered significantly because of government policies of promoting the high yielding varieties of seeds along with chemical fertilizers and pesticides and providing irrigation facilities at subsidized rates. The production of local varieties of cereals has also been affected by change in food habits of the people and market demand and consumption pattern. Loss of domesticated animal biodiversity is mainly because of mechanization of agriculture, improved transportation facilities making the animal drought power secondary.

Major Actors and their Current Roles Relevant to Biodiversity and Ongoing Initiatives: The local society is considered as important stakeholder and plays an important role in the natural resource management and biodiversity conservation. Its different sections have different utilization patterns, conservation options and priorities about biodiversity. As perceived from the community interactions, there are ten major user groups on the basis of their relationships with the existing biodiversity. These user groups are Farmers, Pastorals, Fuel wood, Fodder and Green manure, Wild vegetable and fruit, Gum collectors, Herbal healers, Village priests, Labourers or seasonal migrants and Artisans. All user groups are related with agriculture and animal husbandry directly or indirectly as well as cultural, environmental, religious, subsistence and medicinal value of biodiversity.

An NGO, *Tarun Bharat Sangh* has been working for mobilising people of the area for their own resource management for the last 20 years and creating awareness towards biodiversity conservation of the area. With the support of TBS, local community initiatives have achieved exciting success in regeneration of forests, reviving wildlife and traditional system of water conservation. TBS, seeing the degradation of forests and lowering of the water table in the area, motivated the villagers to construct rainwater harvesting "*Johads*" around which life thrives and simultaneously protect the natural forests. These *Johads* got filled up with rainwater during monsoon and provided much needed relief to the villagers. Seeing success, a chain reaction started in the area. The villagers started making their own rules and regulations for village resource management and in several villages, people resolved not to carry any axe inside the forests. The forest cover has started reviving again and even the wild animals have also staged a come back. The wooded hill slopes and *Johads* collectively recharge the ground water in the area.

National Forest Policy enunciated by the Government of India, from time to time and Forest Act have played an important role in conservation of forests all over the country. The Policy of the Government of India (1988) lays emphasis on meeting the domestic requirements of fuel wood, fodder, minor forest produce and construction timber of the people living in the forests. The new policy emphasizes that these items or substitute materials should be made available at reasonable prices. This was a marked shift in the policy at National level in the management objectives of the forests. The shift was from meeting the commercial demands of the forest products and maximising the state revenue to meet the local needs of the people. Another shift was involvement of the local people in the protection and management of forests by constituting Forest Protection and Management Committees. The GOI, in pursuance of the new forest policy issued detailed guidelines for a massive people's movement for protection, development and management of degraded forests by involving the local communities on June 1, 1990. The externally aided projects for afforestation of Aravallis (*Arvari* is also a part of Aravallis) were implemented by involving VFPMCs under JFM programme in the state of *Rajasthan*. Because of the involvement of the local communities in all the stages, right from micro planning to the completion of plantation and its subsequent management, encouraging results have been seen. These afforestation projects have substantially increased the supply of forest produce from the areas and have led to an economic emancipation of under-privileged group especially women who have benefited from the increased supply of fodder, fuel and other non-timber forest produce.

The forest department is presently-providing protection to wildlife and its habitats. Although a number of wild species are on the fringe of extinction in the area, still no research work is being undertaken to study their ecological status. Increase in the populations of some of the wild animals like *Nilgai* is causing problem to the farmers in the area.

The Agriculture department is emphasising on availability of quality and improved seeds of high yielding varieties to increase the production. However, the department is not in any way providing incentive to the cultivators for growing indigenous varieties of crops and other land races. Intensive agriculture with irrigation with tube-wells is lowering the underground water table in the area. In the *Arvari* basin, farmers are practicing agro-forestry by protecting the natural growth and regeneration of trees and shrubs on the field boundaries and planting saplings of trees like *Ardu* (*Ailanthus excelsa*) for fodder, *Neem* (*Azadirachta indica*), *Shisham* (*Dalbergia sissoo*), *Deshi babool* (*Acacia nilotica*) for multipurpose use. These trees provide additional income to the cultivators.

Gap Analysis

India has a land based economy, so the importance of biodiversity becomes much more crucial for the sustainable development. The policy makers and those who are engaged in decision making at various levels have not fully understood the value of biodiversity conservation not only for better future generation but also for the present scenario. The basic problems such as poverty alleviation can be tackled through conservation of biodiversity and also to achieve sustainable development of bio-resources for future generation. Development of the area is generally associated with providing electricity, roads, irrigation etc. and the development of natural resources like conservation of rainwater, forests and pastures generally gets a backseat. This is mainly because of the lack of informed vision at all levels. Although, *Arvari* catchment and the surrounding area is rich in biodiversity but has not been fully explored. No systematic surveys and ecological studies of threatened and endangered animals, impact of development activities and mining operations, effect of fertilizers used extensively in the area and pesticides, introduction of exotic species and community initiatives etc. have not been undertaken. Information about the status of medicinal plants, their productivity and exploitation is totally lacking.

Drought is a common feature in the area. The state government, in order to provide relief work to the drought-affected people undertake employment generating relief works, preferred construction of roads. They do not contribute much in combating the future droughts. Very low priority is given to the afforestation works and construction of rainwater harvesting structures. The importance of grasslands in the rural economy primarily based on agriculture and animal husbandry has not been properly visualised by the state. Community aspirations for its livelihood aspects are not given due weightage while visioning the development programmes by the government functionaries. A study of legal implications of community-based conservation (*Upadhyay 1999*) mentions that forests and wildlife laws in the state of *Rajasthan* have very few statuary provisions that facilitate community participation. The central constitutional amendment could provide direct involvement of local participation in management and preservation of natural resources but the *Rajasthan Panchayat Raj* Act which followed the central legislation, does not give much power to the village institutions regarding management of local natural resources. There is a need to review the wildlife protection Act to provide for creation of protected areas with involvement of local communities and safeguarding their traditional rights over its benefits and also the need for an institutional structure for bringing the stakeholders together on a regular basis.

Strategies Suggested to fill Gaps and Strengthen the Ongoing Measures

Addressing the socio-economic aspirations of the people is the only way to create personal stakes in the maintenance and sustainable use of the biodiversity. Strategies suggested are based on a system of decentralized governance in conjunction with CBOs, NGOs and State Departments. The functioning mechanism of the involved agencies in the decentralized model would be participatory, transparent and accountable to the local communities. Based on these assumptions and filling gaps, the specific strategies include:

- Creation of awareness, formation and strengthening community groups and building their capacity for dealing with biodiversity issues;
- Restoration of degraded forests giving high priority to natural regeneration;
- Improving nursery and agro-forestry practices;
- Increasing the productivity of indigenous species;
- Propagating cultivation of medicinal plants for local consumption and exploring market system;
- Eradication of exotic noxious weeds;
- Developing and improving grasslands;
- Improving habitat of the existing protected areas and strengthening the protection machinery;
- Giving top priority to forestry, construction and maintenance of water harvesting structures and pasture land development while taking up drought proofing and famine relief works. The biodiversity conservation interventions be weaved around conservation of water and livelihoods of the local people.

The strategy also emphasizes for agricultural biodiversity on ensuring government support in the form of minimum support price for cultivation of indigenous / land races relating to different crops, encouraging and educating farmers for producing Vermi-compost for enhancing organic farming and documenting traditional wisdom and skills of the people.

Mining in all ecologically sensitive areas to be stopped. An independent body to be constituted to assess the impact of mining on biodiversity and livelihood of the people

and take steps to check its ill effects and ensure safe disposal of the overburden waste from the mining activity. Reviews of existing policies and regulatory frameworks relating to conservation of biodiversity be undertaken from the point of view of preservation of bio-resources and local livelihoods. Biodiversity to be made a part of school curriculum. Poverty alleviation programmes to focus on skill improvement of economically deprived people.

Suggested Actions to fill Gaps and Strengthen Ongoing Measures

Based on identified gap and proposed strategies, actions have been suggested to enhance / strengthen community oriented ongoing measures supported by government as well as NGO. A total of 26 action plans have been proposed. Seeing the need of taking immediate steps to address key issues such as survival of wild life, livelihoods of inhabitants and combating drought situations 11 actions points have been recommended in the category of high priority and remaining points in the category of medium priority. Seven points are related to capacity building and empowering people's organisations such as *Arvari Sansad, Gram Sabhas (Lok Samitis),* Women's groups, JFMCs etc. for sustainable natural resource management and dealing with critical biodiversity issues. Next eight actions have been proposed to undertake assessment studies on various aspects of biodiversity and impact of various development activities on livelihood of the people and ecology of the area and dealing policy and legal issues in the interest of the people. Ten actions have been suggested for formulation and implementation of development schemes for addressing people's livelihood and biodiversity conservation issues. Last two actions are to integrate biodiversity components in school curriculum.

Operational Implementation of the Action Plans and Follow-up

The proposed Strategies and Action Plans would be implemented through collaborative efforts of several community-based organisations like *Arvari Sansad*, PRIs, Women's groups etc. and government departments. *Tarun Bharat Sangh*, a local NGO will have the core responsibility of capacity building of people's groups, orienting government functionaries in community base4d, participatory approach of natural resource management, overall coordination and monitoring of the implementation of the action plans.

For successful implementation of the action plans, TBS and government departments will jointly mobilise adequate financial resources to support the activities. Most of the activities will be implemented through *Arvari Sansad* and gradual process will be evolved to shift key roles and responsibilities from TBS to *Arvari Sansad* over a time of five years. The forest department would be an active partner in the entire process of the implementation of BSAP and also in the follow-up actions. Detailed implementation and monitory schedule for each action will be worked out in the beginning of the project by concerned agency.

WATERSHED AREA OF ARWARI NADI

SCALE - 1:50,000

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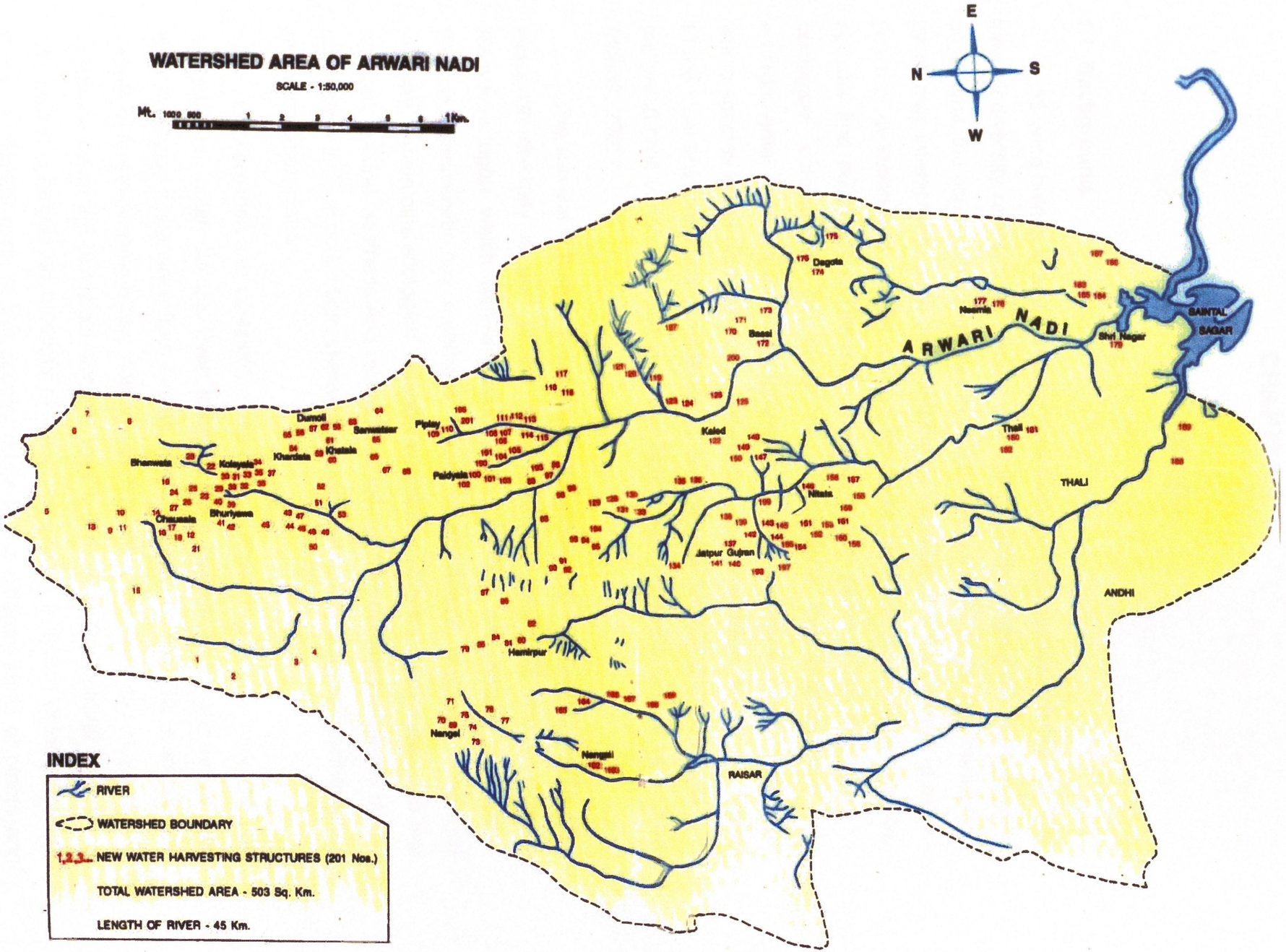


CHAPTER 1

INTRODUCTION

1.1. Background

All living beings in any particular area form the biodiversity of that area. The term biodiversity refers to the variety and the variability among the various living organisms, the ecological complexes in which they normally occur and the ways in which they interact with each other and the geo-sphere. It is the product of million years of evolution and can be divided into three hierarchical categories: genes, species and ecosystems. Diversity of species and genes affect the ability of ecological communities to resist or adapt from the disturbances and environmental changes including long-term climatic changes. Genetic diversity within species is the ultimate basis of evolution, the adaptation of wild population to the local environmental considerations and development of animal breeds and cultivated crop varieties, which yield significant, direct benefits to humanity (*Seva Mandir, 2001*).

The survival of human population is dependant on biological diversity. This biological diversity is part of our daily lives and livelihood and constitutes resources upon which familiar communities, nations and future generations depend. Biodiversity has numerous values in agriculture, medicine, food and industry. It maintains ecological balance, sustains evolutionary processes and has spiritual, cultural, aesthetic and recreational values. The services rendered by the ecosystem include pollination, chemical cycling, nutrient cycling, soil maintenance and climatic regulation.

Conservation and sustainable use of biodiversity has been an integral part of traditional Indian culture. Even today, a large number of people derive their daily livelihood sustenance from forests, rivers, grasslands etc. The practices and beliefs of forest-dwelling tribes, nomadic communities and farmers remain closely intertwined with the biological diversity they live amidst. The cultural diversity of this nation is largely an outcome of the diverse ways in which different people living in different parts of this country relate to the different kinds of plants and animals they are surrounded with.

Threats to biodiversity are numerous and these are increasing day by day. The most serious threats to biodiversity are in the forms of habitat destruction and over exploitation of resources. These are the direct and more immediate causes for decline in the biodiversity. Biodiversity today stands threatened not only in terms of species richness, distribution and habitat destruction but also in terms of knowledge and concern about it. There is considerable erosion in the traditional and wisdom knowledge among the younger generation. In the worldview of people, biodiversity conservation does not feature as an option. Instead, people aspire to achieve such means and alternatives, which would yield them, secure returns over a shorter time frame. Despite being a witness to the steady onslaught of degradation, the people feel disinclined to take a proactive role to reverse the trend. They opine that conservation is the prerogative of the state. Moreover, they feel at a loss to suggest measures to address this problem, as they have not been consulted in this regard for a long time now. The state policies of conservation have tried to address these threats as reflected through the conventional approaches to conservation viz., Imposing regulations / restrictions on use of biodiversity areas and keeping people out of the conservation process. However, little attempt has been made so far to probe into the underlying socio-economic-political factors behind biodiversity loss.

With increase in human and cattle population, the natural resource base has come under stress, so much so that dense forests have been reduced to scrub areas with loss of valuable species which once thrived in the area. The livelihoods of the people linked with collection and sale of minor forest products have become economically unviable. Thus, people assign a low priority to conservation. There has been an alienation of the people from the natural resources due to the centralised decision making, policy structures etc. Because of this, people tend to lose a sense of belongingness with the natural resources on which they depend to a very large extent. The increased biotic stress and declining resource status has led to a loss of people's livelihood sustenance based on natural resources. This has compelled them to look for alternatives in the market in the form of wage employment or commercial exploitation of forest products. Thus, people are in the race of gaining better livelihood options at the risk of misuse of biodiversity. Consequently, the mindset of people has become centred on incentive-based, short-term use values rather than conservation-oriented, long-term, existence value of biodiversity. Wherever traditional

conservation efforts by the community were in practice, they lost ground as the control of these areas got vested with the state. As the state showed little regard to the conservation ethos and initiated exploitation of these lands, the community's faith in the upkeep of these areas also dwindled.

In cases where the local people initiated conservation efforts in the form of organised resistance against the practice of illicit encroachments of common property resources and their de-facto privatisation, they lost out in the absence of a clear state policy in this regard. The state's stand on allowing this loss of commons to continue in an ad-hoc manner, on one level acts an incentive for encroachers to legalise their claims by whatever means and dampens the conservation ethos of the community on the other. At another level, it not only threatens the physical status of the biodiversity housed on these lands by their conversion from forest / pastures to crop lands, but also the livelihood systems of various marginalized groups in the village who sustain on gathering and collection of fruits, NTFP etc from these commons.

The problem of conservation is a complex one. However, till date, it has only been addressed through state measures like creation of protected areas, curtailment of community rights over resources, zero level of human interference in conservation areas, focus on priority plant and animal species and keeping conservation as a state controlled agenda. The protected areas have been successful in staving off threats. This reveals that state efforts have definitely not been adequate and in many places, even where successful, have created other problems like conflicts with local communities (Seva Mandir, 2001).

It is evident that in order to address the problem of biodiversity conservation, there is need to understand the priorities of the local people with regards to conservation and the process involved in motivating them to take up conservation on a sustained basis. Thus, there is no shortcut to conservation. The way out of this is to address the socio-economic conditions that cause deprivation amongst communities and create personal stakes in the maintenance and sustainable use of biodiversity (*Seva Mandir, 2001*).

To prevent continuing genetic erosion and to promote concerted effort to conserve biodiversity by all nations, acting both individually and collectively, a United Nations *Convention on Biological Diversity* (CBD) was adopted at the UN conference on environment and development in 1992. It came into force in

December 1993. So far, over 174 countries including India have ratified the CBD. It provides a framework for integrated action in biodiversity conservation, sustainable use and equitable sharing of the benefits. To implement the provision of the CBD, the government of India initiated the process of preparation of *National Biodiversity strategy and Action Plan* (NBSAP) in the year 2000. It is being carried out at five different levels: local (sub-state), state / union territory, eco-region (inter-state), thematic and national (Sharma, 2002).

1.2. Scope

The present document defines the status of biodiversity of the *Arvari basin* of *Rajasthan*. It suggests *Strategy and Action Plan* (SAP) for its conservation and sustainable use. The *Arvari* region lies in the *Thanagazi* block of *Alwar* and *Jamwa Ramgarh* block of *Jaipur* district in *Rajasthan*.

Climatically, the area is semi-arid with a meagre 620 mm of average annual rainfall. The forest, in this region, are deciduous in nature, most trees having shrub like appearance with low height, small leaves, thorny branches and stems so typical of desert vegetation. The present status of natural vegetation and its biological diversity in *Arvari catchment* is extremely poor and so disrupted that it is difficult to even assess it properly. This destruction of biodiversity has also been caused by many factors and reasons, but policies and laws introduced and enforced by government play a significant role in this regard. Almost all government policies, rules, regulations and schemes end up working in a negative direction, especially at grass root levels (*Singh, 1997; Upadhyay, 1999*). Today, even in traditional communities and village institution the traditional system of conservation and management of natural resources stand seriously deteriorated. The new value system and the enforced State control over the land has placed communities aside and away from the management of natural resources and conservation of both flora and fauna.

In the SAP for *Arvari catchment*, the different levels of biodiversity in the context of the issues like conservation, sustainability, equitable use encompassing the scientific, economic and cultural dimensions, an attempt has been made to cover the entire range of biodiversity available in the area in form of natural eco-system, agriculture eco-system, wetlands including the animal biodiversity (wild as well as domesticated). The document also covers people's perception about

biodiversity and the practices adopted by them for its conservation. It also tries to document socio-economic and cultural ways related to nature.

Biodiversity is not homogeneously distributed in the region. Some patches have many and concentrated species whereas others have few and scattered. Various user groups have different priority for conservation of different patches of biodiversity. As such an effort has been made to study and investigate how various components of biodiversity are distributed, utilised and need conservation in different patches belonging to various habitat types. Presently, it appears that the community initiatives supported by external agencies through strength building of the community could serve to regenerate the natural resources and result in the revival of the richness of the biodiversity of the area. Although, the people of the area are organised for a sustainable management of the natural resources, but they have achieved very little success. In some pockets of the region, the overall status of the biodiversity in all its forms i.e. wild as well as domesticated is on the verge of decline.

Some successful community initiatives (such as *Bhaonta-Koylala*) could be expanded to larger areas through strength building of *Arvari Sansad*. A joint Action Plan could be worked out with community and Forest department for implementing the SAP.

1.3. Objectives

The objectives of this BSAP are:

- To investigate and document the present status of biodiversity in the *Arvari* catchment.
- To identify causes of deterioration of biodiversity in the region.
- Strategise to stop the degradation of the natural resources and attempt to restore those resources that have disappeared / degraded and the ecological status.
- To revive the best traditional practices and indigenous knowledge of the people for conserving the biodiversity and physical environment.
- To involve the community people in day-to-day biological resource management by creating their stakes in its management and its judicious utilization of the resources.

- To evolve a process of resolving conflicts between different stakeholders (especially forest deptt. and community) on issues of land, forest and water.
- To preserve the land races by providing some economic incentives to the farmers for cultivation of such crops.
- To promote sustainable utilisation of natural resources for meeting their needs of fuel, fodder, material for housing of the local people, raw material for a wide range of cottage / rural industries, medicines and genetic resources for agriculture.
- To inculcate a positive attitude among the community people towards conservation of biodiversity of the area and to make them aware of the appropriate use of science and technology for the NRM.
- To identify legal and financial measures necessary for promoting awareness and conservation of biodiversity.
- To promote coordination between different stakeholders including government, public institutions, community groups, women groups etc.
- To establish a process of training and research for the continuous strength building of the people for NRM.
- To prepare an Action Plan based on the needs and aspirations of the community people including the women and the downtrodden sections of the society.

1.4. Contents

This SAP document describes the present status of the biodiversity of the *Arvari catchment* sub--state spread over about 72 villages of *Thanagazi* block (*Alwar)* and *Jamwa Ramgarh* block (*Jaipur)* in *Rajasthan* covering an area of 503 sq km and identify the factors causing deterioration of the biodiversity as per the assessment of the local communities, scientists, social scientists, development experts, NGO(s), forest department officials and investigating team. It covers mainly the following components:

- Present status of natural biodiversity (including both floral and faunal elements). Reasons for its degradation, approaches evolved by the local

communities for the restoration and conservation of forest and wildlife and revival of traditional relationship between the people and the forest.

- To study the changes in agricultural biodiversity and to examine suggestions elicited from the community people through interaction for conservation of land, races and fertility of the soil.
- Present status of domesticated animals and fisheries; causes of degradation and suggest measures for improvement in the livelihood status of the people.

1.5. Methodology

Executive Director and General Secretary of *Tarun Bharat Sangh, Shri Rajendra Singh* constituted a Local Advisory Committee in consultation with *Shri Kanhaiya Lal Gurjar*, the convenor of the *Arvari Sansad* (*Annexure III*) consisting of members from different sections of the society. He identified *Dr. O P Kulhari* as a coordinator for *Arvari* BSAP preparation who has experience of TBS approach, *Arvari* region and knowledge about the biodiversity. *Mr. Kanhaiya Lal Gurjar*, the convenor of *Arvari Sansad* was asked to extend his cooperation in the entire process of BSAP preparation. This was done in consultation with *Ms. Kanchi Kohli and Ms. Bansuri Taneja* of *Kalpavriksh.* The coordinator firstly tried to understand the objectives and conceptual framework of the project by organising detailed discussions with the members of technical implementing agency, *Kalpavriksh* and TBS executive director. Then, a tentative Work-Plan for undertaking the activities in a phased manner was worked out.

The broad objectives of the National Biodiversity Strategy and Action Plan (NBSAP) and suggested format of Strategy and Action Plans (SAPs) were kept in mind while selecting or designing particular methodology. As a first step a series of discussion meetings (both formal and informal) were organised with the TBS faculty members, field workers, officials of forest departments and representatives of PRIs, members *of Arvari Sansad* and stakeholder (including both men, women and farmers). This effort was followed by consultations with experts, scientists including (social scientists), economists, wildlife experts, botanists and zoologists. As a result of these interactions a specific planning was done to undertake field study. It was considered necessary to adopt a participative approach to collect information.

1.5.1. Field Study

Following are the steps involved in the field study:

- **Formation of Field Survey Team:** The survey team comprised of two members of *Arvari Sansad*, one TBS field worker, one wildlife expert, one field botanist (floristic expert), one zoologist (researched on sacred groves of the area). This team was laid with one field coordinator who was senior TBS worker but he was closely assisted by one of the team experts in planning and documentation (*Annexure I*).

- **Formation of Format:** Before the commencement of the actual fieldwork, it was necessary to prepare a detailed format to collect data and information for each village (villages selected for case studies). A list of open-ended / semistructured questions was prepared for focussed group discussion (FGD) for the village level community meetings (See Field Survey Format in ***Annexure VIII)***.

- **Selection of Villages for Case Studies:** It was decided in a meeting between TBS faculty and representatives of technical group for NBSAP (*Kalpavriksh*) that a sample of three villages should be selected for detailed village level case studies and that the selected villages should be representatives of the entire region. The following were the selected sample villages, the names of which were suggested by some of the LAC members:

    - *Bhaonta-Koylala* where community initiatives made success in conserving biodiversity in the region.
    - *Samara* is a typical successful example of rejuvenation of forest through community efforts that have recently begun.
    - *Kalsi Kala – Jhiri ka Guwara* is a village suffering from excessive Marble Mining.

In the first meeting of the sub-state LAC on 23 May 2001, the members felt it necessary to do a detailed study of three more villages. For this, *Khaidata, Sainthal Sagar (Borunda)* and *Dumoli Khatala* villages were identified. The task was assigned to two members of the LAC, *Mr. Virendra Singh* (school teacher) and *Mr. Kanhaiya Lal Gurjar*, convenor of *Arvari Sansad*. They prepared detailed profiles of these villages in a period of two and half months. The TBS field workers

and *Arvari Sansad* members had some rapport with the community people of these villages and the methodology was built on this rapport.

Preparation for Field Kits, Equipments and Stationery required for the Survey: The bulk of the investigations were carried out by field studies in the *Arvari* region. Actual contact was made with the local communities and information, suggestions / perceptions taken directly from them. Advance planning, studies, arrangement and preparation preceded the field visits.

The following articles were ensured in the field kit:

- Plant collecting equipment (for identification of plants which were not identified on the spot).
- Equipments required for documentation were Camera, Tape recorder, Field Diaries, notebooks, slip pads etc.
- Pencils, Erasers, Blades, Measuring tape, Magnifying lens were included in the kit, which helped accessing reliable information in easy manner. Other miscellaneous items such as torch, candles, matchboxes etc were found useful in some way.

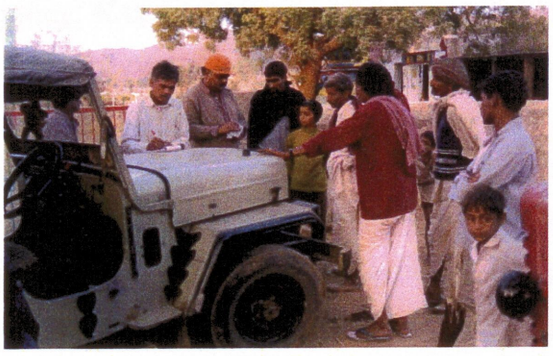
Field Work: The entire team had done extensive fieldwork from early morning to late in the night for four days (17-20 December 2000). They travelled by Jeep or Motorcycles. The team members had organised several meetings with community people during early morning or late evenings since in daytime people were found in their livelihood chores. Rapport with the local communities was established for seeking their cooperation for collecting information of biodiversity. The problems faced by them, their perceptions, valuable suggestions were recorded and later on processed, field notes were taken regarding the flora and fauna (including small animal world like termites, insects, spiders, ants etc.). To make certain that no details or observation taken during the day were forgotten, daily report was written at night.

Photographs: The landscape of the area surveyed, common & rare plants and persons interviewed were photographed.

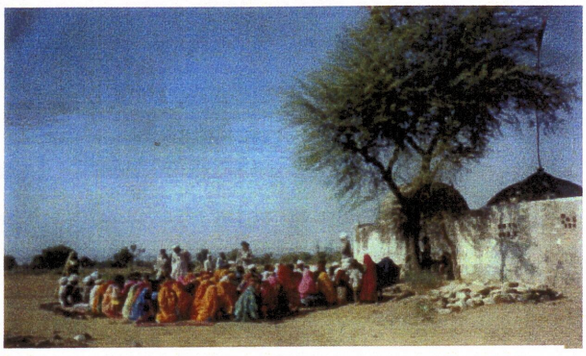
Tape Recordings: A pocket tape recorder was employed for recording the interviews. For recording, C-90 Cassettes were preferred.

1.5.2. Public Participation

Several discussion meetings with farmers, members of *Arvari Sansad*, *gram sabhas*, women's groups, teachers and students in 13 villages and public hearing cum workshops were organised for seeking cooperation and eliciting perceptions of different sections of the society including village communities



3. Collection information from *Kalsi-Kala* Villagers.



4. *Arvari Sansad* discussing biodiversity issues (Dec.2001)

Box 1

Community Interactions

The issue that emerged from the interactions held with the local people during the meetings organised in 13 villages of the region and the information provided by the members of *Arvari Sansad* and from other sources are as follows:

- People faces survival problem in the marble mining areas and a high loss of biodiversity.
- Reduction in the forest area when local community is not involved in its management.
- Adverse effects of introduced exotics in the forest / village common lands.
- Mechanisation and modernisation of agriculture and increased use of high yielding varieties of seeds, insecticides / pesticides and chemical fertilizers.
- Hunting of wild animals and migratory birds by outside people e.g. in *Sainthal Sagar*. Several migratory birds come here and are killed by outside poachers.
- Management of the ground water for irrigation purposes.
- Ignorance of the traditional wisdom and knowledge of the people for the management of natural resources. In *Sainthal Sagar*, community is not involved in its management and total control over it is that of State government department.
- No legal status given to the community organisations like *Bhaonta-Koylala* and *Arvari Sansad*, which made successful efforts for sustenance and regeneration of forest and other resources.
- Increasing population of *Neelgai* (*Rojda*) is causing heavy damage to the crops.
- Contract (*Thekka)* for cultivation of *Kamalgatta* and fisheries in the water bodies of the region.
- Ownership of the forest resources under the 'Forest and wildlife Conservation Act'.

(*Annexure IV*), local artisans, knowledgeable persons (Ayurvedic practioners and traditional medicine persons), women groups, biodiversity experts, planners,

social activists, scientists, media persons. The active involvement of the members of *gram panchayat*, government officials especially of forest, agriculture, irrigation, mining, watershed development, education departments etc. was sought in the process of BSAP. In the entire process of BSAP, periodic consultations with a representative (*Ms. Kanchi Kohli*) of coordinating (Technical Implementing) Agency, *Kalpavriksh* proved very useful for bringing the draft in the present shape *(Annexure IVa and IV b)*.

1.5.3. Consultation of Secondary Sources

All proceedings of *Arvari Parliament (Sansad)* and literature of *Tarun Bharat Sangh* published on various issues of biodiversity, natural resource management, community and NGO initiatives, published and unpublished research material and reports of forest department and scientists working in different research organisations were consulted and relevant information was compiled from these sources for the BSAP draft. The list of references has been given in Chapter 11.

CHAPTER 2

PROFILE OF ARVARI CATCHMENT

2.1. Geographical Profile

Arvari catchment lies in *Thanagazi* block of *Alwar* district and partly in *Jamwa Ramgarh* block of *Jaipur* district in *Rajasthan*. *Alwar* district is located in the northeast of *Rajasthan*, Western India, between 27° 15' and 28° 15' North latitudes and 76° 15' and 77° 0' East longitudes. Temperatures of the area fluctuate from 0° C during some cold winter nights to as high as 49° C during summer season. Mean relative humidity during rainy weather is 63% while average annual rainfall is around 620 mm. 90% of the rainfall occurs during monsoon months (July to September).

The river *Arvari* originates in the *Thanagazi* block of *Alwar* district of Rajasthan. The northern catchments area of the river is around *Kankad-Ki-Dhani*. Of the two sources of the river, one source stream originates near the village *Bhaovta* and the other source stream originates near the village *Agar*. Also, near the village *Amka*, there is a third stream, quite close to the second one, that gets lost in the ground, *Pratapgarh* road at a place called *Palasana-ka-Pahad*. From this point onwards, the river is known as *Arvari.* This rivulet runs down to the village *Hamirpur* and meets *Nahar-Nala*, a stream from the west. At this place, TBS has built a small dam whose length is 500 feet and the height is 11 feet. The small lake, the dam forms, is named *Jabbar-Sagar*, whose submergence extends up to 3 kms upstream. The ever-flowing water now makes its way downstream and meets *Samrawala-Nala*, a stream coming from the East, just north of the village *Samra*. Another stream called *Gujro-ki-Dhani*, which too comes from the East, meets *Arvari* south of Samara. A western stream, named *Nijrawali-Dhani*, also joins *Arvari* north of the village *Kaled*. The water flowing over the *Kunj Sagar* dam continues its course downstream and leaves *Thanagazi* block of *Alwar* district and enters into the *Jamwa - Ramgarh* block of Jaipur district near the village *Basi*. South of *Basi,* comes another sizeable stream from the village *Dagota,* which is located in the *Jamwa - Ramgarh* Wild Life Sanctuary of the Jaipur district. The stream joins and augments the river *Arvari*. The augmented river *Arvari* further joins an equally big tributary near the place called *Ramewala* –

the tributary having its origin around the village *Lothabas* in the West and then passing through the *Jaitpur-Gujrun, Rasayawala* and *Rayanwal* regions. By this time, *Arvari* becomes a river in her own right and gets lost in her own big reservoir, *Sainthal Sagar,* which came into existence due to a large dam on the same river (*Patel, 1997*). *(See details in Map of Arvari Watershed)*.

The area may be divided into two parts, hilly tracts, and plains. The well-known *Sariska* Tiger reserve is adjacent to the *Arvari* catchment and another important protected area in Jaipur district is *Jamwa - Ramgarh* Wildlife Sanctuary, which is adjacent to the *Arvari* region on the southern side. Both protected areas have rich biodiversity (*Sharma, 2000*). Thus, *Arvari* region becomes important for bio-resource conservation. Total area of the *Arvari* catchment is about 503 sq. km. The length of the rivulet *Arvari* is 45 km.

Box 2

Sainthal Sagar

The *Sainthal Sagar* is a traditional water reservoir constructed by erstwhile *Jaipur State* in 1898 and is located on the boundary between *Jaipur* and *Dausa* districts but it comes under the control of revenue department of *Dausa* tehsil. The total catchment area of the reservoir is 118 sq. mile and its command area is 3228 acres. The maximum water level is RL 90 and the water storage capacity is 484.80 MCF. The length of Waste Weir of the dam is 1085 ft, the length of north canal is 210 chains, and that of south canal is 250 chains. The area is shelter rich bio-diversity and wildlife. Sharma and Kulhari (2000) reported 213 species of birds; it is an important wintering ground of a large number of waterfowls including a variety of migratory birds like Barheaded Goose (*Anser indicus*), Greylag Goose (*A. anser*), Rudy Shelduck (*Tadorna ferruginea*), Pintail (*Anas acuta*), Mallard (*A. platyrhnchos*), Shoveller (*A. clypeata*), White Pelican (*Pelecanus onocrotatus*) etc. Langur and Rheus monkey are pre-dominant species of mammals. Plant species such as *Phragmites Karka, Typha angustata, Nelumbo nucifera* and *Azola fern* commonly occur in the aquatic habitat of the region and provide shelter to several wild species of animals.

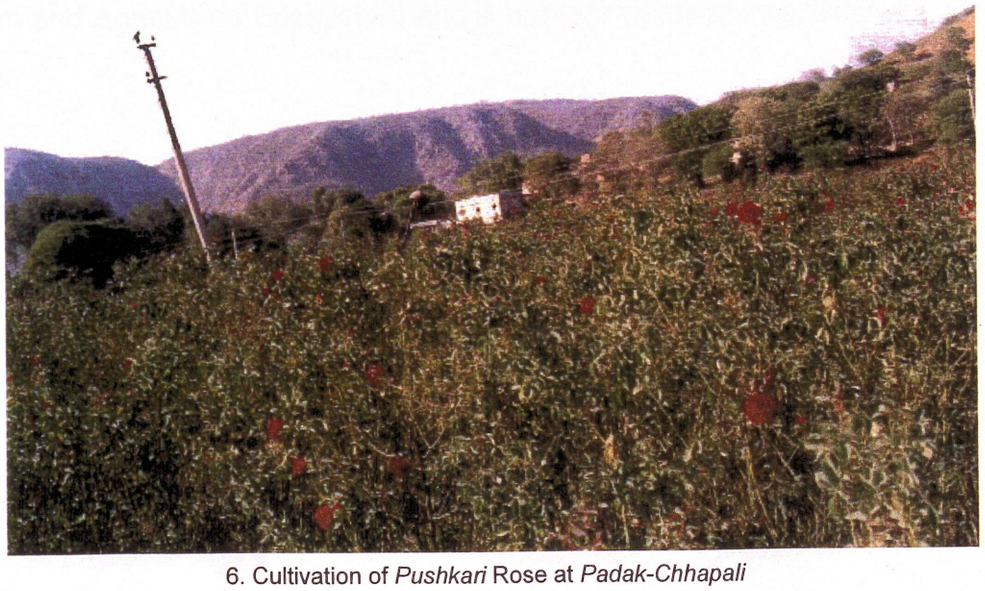
Nabala ki Nadi is flowing in the down stream of *Sainthal Sagar.* An anicut has been constructed on this river where water is available round the year. The livelihood of several people of the area is dependent on *Sainthal Sagar* because they take good *Rabi crop* in the catchment area and cultivate vegetables as cash crops.



5. Migratory Bird Rosy Pelican over *Sainthal Sagar*

2.2. Socio-economic Profile

Most of the ethnic groups and subgroups of Indo-gangetic plains are found in this region (Patel1997). But four major communities, namely *Gurjars, Meena, Balais and Rajputs* are prominent in this tract. According to the norms of traditional social hierarchy, *Rajputs* occupy the highest position in the society; the *Gurjars*, second and the *Balais*, the lowest. While the *Rajputs, Meenas and Gurjars* share ties of commonality they do not eat and drink with the *Balais.* In the past, this hierarchy was reflected in the economic condition of each community. The *Rajputs,* as



6. Cultivation of *Pushkari* Rose at *Padak-Chhapali*

'Jagirdars' (landlords who during the princely times had been awarded lands by the State and were exempted from paying taxes) of the area controlled most of the resources. The *Gurjars, Meenas and Balais* were dependent on the *Rajputs* for employment, waiving of loans and revenue. The hamlets of *Gurjar* communities are found more in the hilly regions because their main occupation is animal husbandry. *Meena* is a scheduled tribe (ST) of the area and is primarily engaged in agriculture. However, after agriculture, animal husbandry is the second occupation of *Meena* tribe. *Gurjars* are nature lovers and prefer wilderness for their habitat. The average land holding per household is between 1 and 1.5 hectare, while the number of cows and buffaloes range from 10 to 15 per household. Both *Gurjars* and *Meena* have direct dependence on forest resources including grass, fuel wood, leaves, honey etc. Both communities are known for their interest in conservation and their traditional skills, strength and self-discipline. The total population of the area is about 70,000.

2.3. Political Profile

Arvari catchment is spreading in *Thanagazi* block of *Alwar* district and *Jamwa Ramgarh* block of Jaipur district. There are 72 villages in both the blocks, out of which 38 villages are located in *Thanagazi* block while the remaining in *Jamwa Ramgarh* block. There are two constituencies of State Legislative Assembly, one for *Thanagazi* and second for *Jamuwa Ramgarh.*

2.4. Ecological Profile

Climatically, *Arvari* basin is semi-arid with a meagre 620 mm annual average rainfall. It has mainly two types of ecosystems and ecological niches viz. Forest Ecosystem and Agriculture Ecosystem and a number of small and medium size waterbodies.

2.4.1.Forest Eco-System: As per classification of forest types by *Champion* and *Seth* (1968) the forests of this region has three main categories:

- *Anogeissus pendula* forests
- Northern Dry Mixed Deciduous Forests
- Desert thorn Forests

Patel (1997) described as thorny scrub and subtropical deciduous forests in the area. It can also be classified into the following categories according to landscape types: (i) Hilly tracts (ii) Plains (iii) Water bodies (iv) Sand dunes (v) Road-sides, parks and residences. Most trees occurring in plains and sand dunes are having shrub like appearance with low height, small leaves and thorny branches and stems so typical of desert vegetation. The forest of the area is now found in different stages; some are degraded due to over exploitation/grazing and a few are regenerating through community/ community-forest department joint efforts.

2.4.1.1 Flora: The most common species found in the hilly tracts is *Dhok (Anogeissus pendula*), a slow growing tree species with a height of up to 12 metres. Due to continuous hacking and grazing, this species has been reduced to scrambling bushes. On the higher slopes and plateau *Salar (Boswellia serrata* and *Dansaria (Rhus mysurensis*) are found. The other common species are *Gurjan (Lannea coromendalia), Khair (Acacia catechu), Khairi (Acacia senegal), Jhari (Ziziphus nummularia), T*endu *(Diospyros melanoxylon), Jhinjha (Bauhinia racemosa), Kakoon (Flacourtia indica)* etc. A most common shrub Ardusa *(Adhatoda zeylanica*) is found growing gregariously on degraded foothills. The most common tree species in plain area are *Deshi babool* (*Acacia nilotica*), *Roonj* (*Acacia leucophloea*), *Khejri* (*Prosopis cineraria*), *Ker* (*Capparis decidua*), *Arni* (*Clerodendrum phlomoides*), *Murali* (*Lycium barbarum*), *Kankera* (*Maytenus emarginata*), *Hingota* (*Balanites aegyptiaca*) etc. Perennial herbs and shrubs like *Munj/Kuncha* (*Saccharum bengalense*), *Kans* (*Saccharum spontaneus*), *Daab* (*Desmostachya bippinata*), *Aak* (*Calotropics procera*), *Khimp* (*Leptadenia pyrotechnica*), *Bui* (*Aerva persica*), *Pal / Ber ki Jhari* (*Ziziphus nummularia*), *Kharsana* (*Crotalaria burhia*) (present study).

In the area, there are several water bodies, temporary ponds, nallas and seasonal rivulet. They support a variety of aquatic flora such as some free floating species like *Lemna minor* and *Pistia stratiotes* found in reservoirs, ponds and puddles. The plants rooted in muddy substratum and with leaves floating above water surface found in the area are *Aponogeton nutans* and *Kamalgatta* (*Nelumbo nuciefera*). Some anchored and submerged species having contact with water and are rooted in the muddy soils at the bottom of the water bodies are *Hydrilla verticillata, Potamogeton crispus, P. nodosus* and *Vallisneria spiralis*. On the banks of ponds and streams emergent anchored species grow luxuriantly during

the rainy season and winters. Common examples of such species are: *Cyperus alutus, C. cuspidatus, C. digetatus, C. flavidus, C. squarosus, Echinochloa crus-galli, E. stagnina, Eleusine indica, Fimbristylis dichotoma, F. ferruginea, F. squarrosa, Hoppea dichotoma, Scirpus roylai, Typha angustata and* species of *Paspaliduim* and *Paspalum*. Wetland or marshy plants form rich vegetation when water recedes and the land becomes exposed. Common plants observed during present study were : *Aeschynomene indica, Alternanthera sessilis, Ammania baccifera, Dentela repens, Eclipta prostrata, Polygonum glabrum, P. plebieum, Potentilla supina* and species of *Cynotis, Cyperus, Hygrophila, Lindernia, Lipocarpha* and *Paspaliduim*. Plants like *Ageratum conyzoides, Atriplex crassifolia, Bacopa monnieri, Bergia ammaniodes, Boerhavia chinensis, Chrozophora rotteleri, Coldenia procumbens, Commicarpus verticillatus, Corchorus depressus, Glinus lotoides, Phyla nodiflora, Rumex dentatus, Trigonella occulta* and tree species *like Phoenix sylvestris (Jangli Khajoor*) which generally come up after drying of the water in the ponds (see *Annexure* VII *B*).

2.4.1.2 Fauna: The common wild animals in the area are: *Lal Mukh ka Bander* (*Rhesus macaque*), Grey *Langur*, Small Indian Civet, *Bijju* (Common Palmcibete), Small Indian Mongoose, Grey Mongoose, Jackal, Long-eared Hedgehog, Grey Musk Shrew, Flying fox, *Jungli Chuha* (*Meriones hurrianae), Vriksh Chuha (Vendelewria oleracea), Jhari Chuha (Golunda ellioti)*, Indian porcupine, Indian hare. The animals like *Nilgai* (blue bull), Five stripped Palm Squirrel, Common House Rat, and House Mouse are found abundantly in the area. The animals like Tiger (*Nahar*), Leopard, Jungle cat (*Jangli Billi*), Caracal (*Syahgosh*), Ruddy Mongoose, Striped Hyena, Wolf, Indian Fox, *Ghoos* (*Bendicota bengalensis)*, *Sambhar*, *Chital* and Indian Wild Boar are rarely seen in the area. Reptilian species like Northern House Gecko, Common Garden Lizard, Snake Skink, Common Indian Monitor (*Goh*), John's Earth Boa (Sawad Chaklond), Cat Snake, Russell's Earth Boa, Checkered Keelback (Panika Snap), Ratsnake (*Gurha*), Indian Cobra (*Kala Samp*), Saw-scaled Vipers etc. occur commonly in the area. Common birds of the area are: *Bulbull* (Red Whiskered), Cuckoo (Pied Crested), Dove (Red Turtle), Hoopone, Lawing (three species: grey headed, Redwatlled and Spurwinged), *Myna* (three species: *Brahminy*, Common and Pied), Owl (Great Horned), Spurfowl (Painted and Red), Tree Pie (Indian), Woodpecker (Yellow fronted pied), House sparrow, Crow, Peacock etc. Three species of Vulture Black or King, Indian Longbilled and Indian Whitebacked were seen few years back but

now completely disappeared from the area. There are several species of insects including butterflies, spiders and a few species of amphibians found in the area. In water bodies, a number of species of Molluscs and fish are found (*Sharma, Dr. Satish Kumar, a personnel communication, April 23, 2001)* (see details in *Annexure* VII A*)*.

2.4.2. Agriculture Eco- system

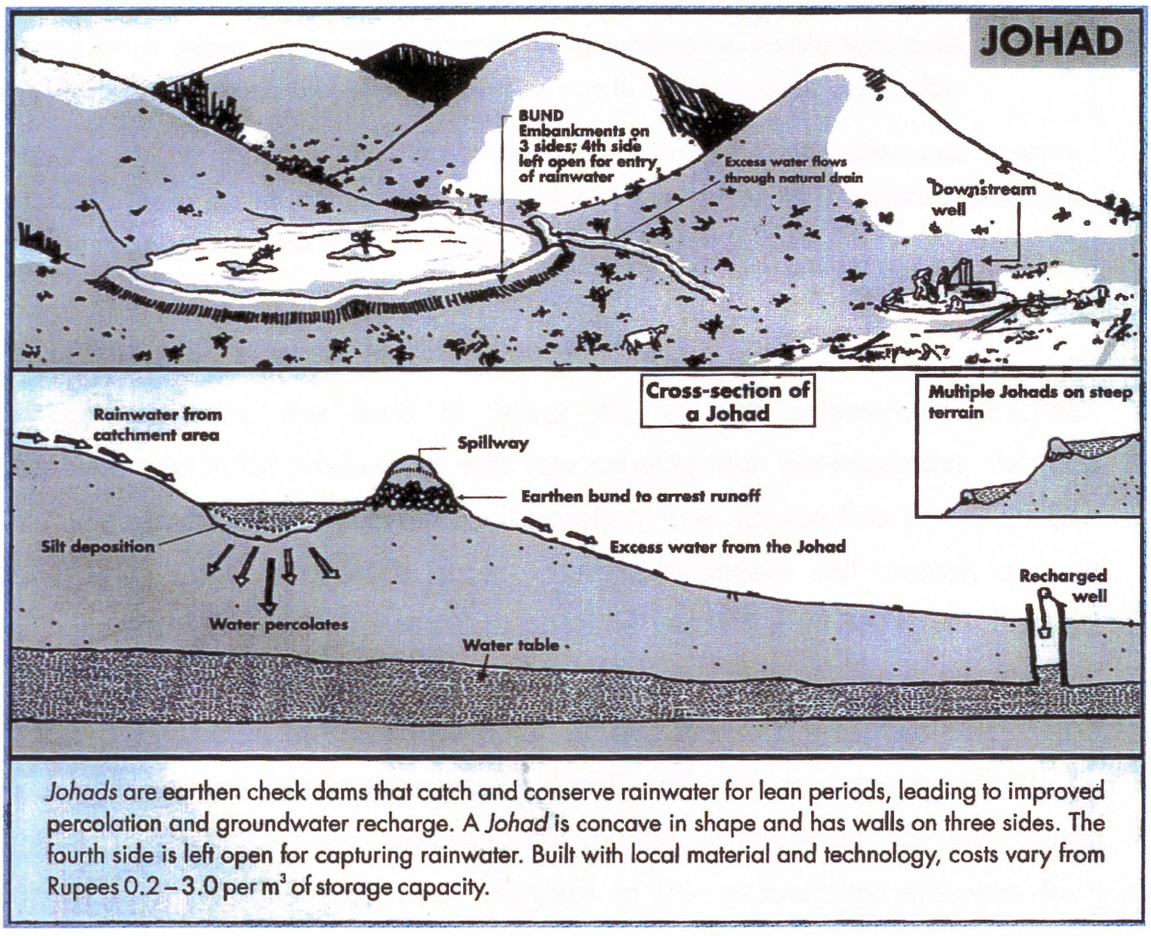
Arvari catchment is characterised by the occurrence of erratic rainfall. Two crop patterns exist in most part of the area. The *Kharif* crop is grown during monsoon season under rain fed conditions. The major crops of the area *Bajra, Maize, Jawar*, Groundnut (*Moongphali*), Sesame (*Til*), *Kali Jiri*, 2-3 pulses mainly Mung etc. Improved varieties/ hybrid seeds of *bajra* are grown by most farmers. In Rabi crop, wheat, mustard and gram (*Channa*) cultivation is a common practice in irrigated lands throughout the area but *Tara-mira* (*Eruca sativa*), barley and gram are also frequently grown in rain fed areas. Several varieties of improved seeds of wheat crop are also grown.

Other vegetable yielding plants like *Bhindi* (*Abelmoschus esculentus*), *Gajar* (*Daucus carota*), *Muli* (*Raphanus sativus)*, *Bengan* (*Solanum melongena*), *Bandgobi* (*Brassica oleracea var. capitata*), *Phoolgobi* (*Brassica oleracea var. botrytis*), *Kaddu* (*Cucurbita maxima*), *Kakree* (*Cucumis sativus*), *Sakarkanda* (*Ipomoea batatas*), *Tarbooj* (*Citrullus lanatus*) etc. are extensively cultivated in places where the irrigation facilities are available. These vegetables are grown in nearby water ponds and in banks of rivulet *Arvari*. Most of the farmers who have irrigation facilities have switched over from traditional method of subsistence farming to commercial farming. However, there is a general increase in the use of chemical fertilizers, adoption of high yielding varieties of crop seeds, use of chemical insecticides / pesticides / fungicides. The use of mechanical farming techniques is increasing like most farmers use tractors for ploughing lands and use thresher machines for separating crop seeds from husk. (information collected during present study)

2.4.3. Waterbodies

There are about 250 water harvesting structures (*Johad*) and anicuts build along the catchment of the rivulet *Arvari*.

Over a period of 15 years, these structures have replenished ground water and increased the water table enabling the river to flow perennially again. For regulating resource use in the *Arvari* catchment, a people's parliament *(Arvari Sansad*) was formed for taking collective decisions.



Johads are earthen check dams that catch and conserve rainwater for lean periods, leading to improved percolation and groundwater recharge. A *Johad* is concave in shape and has walls on three sides. The fourth side is left open for capturing rainwater. Built with local material and technology, costs vary from Rupees 0.2 – 3.0 per m^3 of storage capacity.

7. An illustration of Johad.

An important water reservoir in the area is *Saithal Sagar*. This water body has rich aquatic flora and fauna. Seen details on page 13 in box 2.

Box 3

Johad provides water to the local village communities for irrigation, drinking and for other domestic purposes. It increases bio-mass productivity / fodder availability and gives women more time for child-care, encourages micro entrepreneurships i.e. surplus food grain, milk and milk products, better impact on health and hygiene due to increased water availability.

Johad are much more than mere water harvesting structures for the community to which they belong. These are an integral part of the socio-cultural milieu. Most ceremonies do take *Johad* into account as if these mute structures are part of a large family.

2.5. Brief History

During 1980s, the area of *Alwar* district had somewhat desertified landscape. Agricultural productivity was low causing high out-migration. Pastoral activity was not enough to prevent this migration. The outside hills of the *Sariska Reserve* were largely devoid of forest cover and severe soil erosion created agricultural problems and degradation of natural vegetation (TBS 1995). Further, the Central Ground Water Board determined that extraction of ground water in the area was greater than the recharge potential and the area was thus classified a "dark zone". Rainfall was rapidly lost as runoff and surface water availability (in both wells and streams) was limited to the months of monsoon (*Bansuri Taneja 2000*). This situation is somewhat contrary to the picture that emerges from colonial records. Agriculture appears to have been yielding high returns as revenues (from both cultivation and livestock rearing) were recorded as high and regular in the area at the turn of the century (*O'Dwyer 1901*). There appears to have been some potential for even expanding agriculture in *Thanagazi* at that time, though 62% of the land listed as 'uncultivable' because of topographical constraints. There is thus no indication of water scarcity. About 12% of *Alwar's* land area was covered with forest. Total forest products yielded a sizeable income for the state, with bamboo listed as a particularly important product for the state. In addition to forests, numerous grasslands and woodlands were under state ownership and control, though these were often opened up for village use after the state's needs had been met (*Imperial Gazetteer 1908*).

Rainfall was averaged at 60 – 65 cm p.a. during the late 19th and early 20th centuries, similar to the rainfall averages at present. As far as surface water resources are concerned, the Ruparel was perennial and the *Ajabgarh* and *Pratapgarh* (or *Arvari*) streams are variously recorded as having flowed all year round in years of good rainfall (*Imperial Gazetteer 1908*), or as perennial streams. Sugarcane, a water intensive crop was also cultivated in *Thanagazi* during 19th century, though this practice had ceased by the time of the first revenue assessment carried out by colonial authorities (*O'Dwyer 1901*).

Well irrigation is recorded to be of great importance in *Thanagazi*. Ninety eight percent of wells are recorded as holding fresh water, the period of availability of this well water (i.e. in terms of year round water supplies) being dependent on rainfall held by small dams and embankments on field boundaries. The existence of retention structures is further implied by the categorisation of certain cultivated lands as *dhari-land*, occassionally inundated from hill torrents or from releases from irrigation dams. By the end of the 19th century, however the system of small dams and embankments on field boundaries was clearly heightened impact of drought in *Thanagazi* during 1898-99 (*O'Dwyer 1901*).

The disintegration of the water harvesting system becomes significant in view of the central role; its re-establishment has played important role in environmental recovery in the *Arvari basin.* TBS activists and community workers feel that the decline in agricultural conditions was rooted in the state of decay of water harvesting structures. They hold that the loss of local control over natural resources was responsible for this. Similarly, forest cover and quality are believed to have declined as the state established control over forests and communities no longer felt a sense of ownership nor a responsibility towards safeguarding these resources. Non-local agents of deforestation and mining operations, which enjoyed protection from the state, caused degradation in their own height and further alienated the local populace from their resource base (*Bansuri Taneja 2000*).

Story of *Arvari*'s revival is the story of the 72 villages in its 503 sq. km watershed: Trailing the 45 km river is a journey back in time. As the river slices through lush green fields, the villagers constantly recall its past: " It was dead, like the skeleton of a 100 – year old person. The fields on its banks were barren".

In the 18th century, according to the Alwar State gazetteer, *Arvari* was known as the Pratapgarh Nala and was considered the main groundwater recharge stream for the villages on its banks. Today, nobody can remember seeing it flow except during the monsoon. But Dead River's course was intact underground, the result of seasonal runoff.

Of the two main sources of the river, one stream originates near *Bhaonta – Koylala* and other near village *Agar*. The two streams meet near the *Ajabgarh – Pratapgarh* road at *Palsana–ka–Pahad*. From here to its confluence in the reservoir of a dam on the river *Sainthal*, the river is known as *Arvari*.

In 1986, when the villagers of *Bhaonta – Koylala* built a huge *johad* to catch the gush of water from the surrounding hill-slopes, hardly anybody knew that it was the origin of the river and by conserving rainwater; they were injecting life into the river. Since 1986, about 250 water-harvesting structures have come up in 72 villages in *Arvari*'s watershed. After seeing the benefits of the dam in *Bhaonta*, TBS contributed 50 percent to build a johad of village Kaled at the source of the river, which in 1987 itself got filled up with water. This johad, like the one in *Bhaonta – Koylala* recharged the natural drainage of the river at source (see details at page 61). TBS people never realised that they were recharging a river. Their effort was just to catch and allow water to percolate.

Beginning with Jogiwala johad on a monsoon stream flowing into *Arvari* in the valley, many smaller *Johad* were constructed by villagers. These structures were collectively recharging ground water, as was noticeable in the water table of the wells. Some 72 villages were harvesting water and checking run-off in the catchment area along the river's course.

The economic and ecological miracle of regeneration in *Alwar* district is being brought about by using three percent of the rainfall. This small percentage is being used for irrigation and has made a tremendous change. The region is today thriving and prosperous. In 1990, it flowed till October. In 1991 till January next year; In 1992 till February next year; In 1993 till March next year and in 1994 it flowed till April next year. So, it can be said that the river *Arvari* came to life and started to flow again for the full year in 1994 and it has been perennial since then. The river *Arvari* came to life through village community efforts. Since then, the aquatic life began to thrive itself in the river. Now, the government of *Rajasthan* is

claiming control over the river. Obviously, the community people of the area do not agree with the Government's claim because they gave life to the river. Here the question of ownership and justice arose. The Fisheries department of the Government of *Rajasthan* gave a contract for fishing in the *Arvari* River in November 1996. The residents of *Hamirpur* village did not allow the contractor for fishing in their river. The government administration threatened the villagers for this act. The Department of Fishery issued a notice to the concerned NGO – *Tarun Bharat Sangh* on 02 December 1996 and made following observations.

- The rivers belong to the Government of *Rajasthan*.
- TBS is a party to the present agitation.
- The Fishery Department was giving fishing rights to the fishermen for the past several years.
- If TBS continues to support the river *Arvari's* present agitation, then it would have to face dire consequences.

On December15, 1996, TBS responded to the notice and raised the following points:

- The *Arvari* 's 'People Movement' is right but TBS is not a party to it.
- The Fishery Department should produce the earlier contract papers to TBS so that it could see the terms and conditions therein.



8. Jabbar Sagar anicut

The Fisheries Department did not furnish the earlier contracts perhaps it had none. Its contention that it had been issuing fishing rights for years was not correct. TBS organised a meeting between the village people and Government Officers at *Hamirpur* on December 25, 1996. People conveyed the message to the Government officials that they will not allow fishing in their waters. On January 27, 1997, again the fisheries department informed the community that the legal steps would be taken against any persons who obstruct the contractor from fishing. People organised themselves, and again a meeting was held on January 28, 1997. It was resolved to fight the decision of the Government. The struggle, which was based on *Satyagrah*, finally brought results. The Government withdrew the claim and cancelled the contract for fishing *(Patel, 1997)*.

The Government policies and efforts for conservation, which have given the state full control over forests and wildlife, have caused considerable conflict between people (especially forest dwellers) and the official machinery. For legal implications of community-based conservation (see box 6 on page 58-59).

Another reason of conflict is the decreasing number of tigers in the forests due to poaching by outsiders and loss of habitat, resulting in an increase in number of prey species like the Blue bull (*Neelgai)*, deer and wild boar. Large herds of these herbivores damage agricultural crops of farmers around *Sariska.*

At a meeting held at *Hamirpur* village in 1998, a collective decision was taken by villagers of the *Arvari catchmen*t to form a *Sansad* (parliament) that could help regulate resource use in the *Arvari catchment* (See detailes in chapter 6).

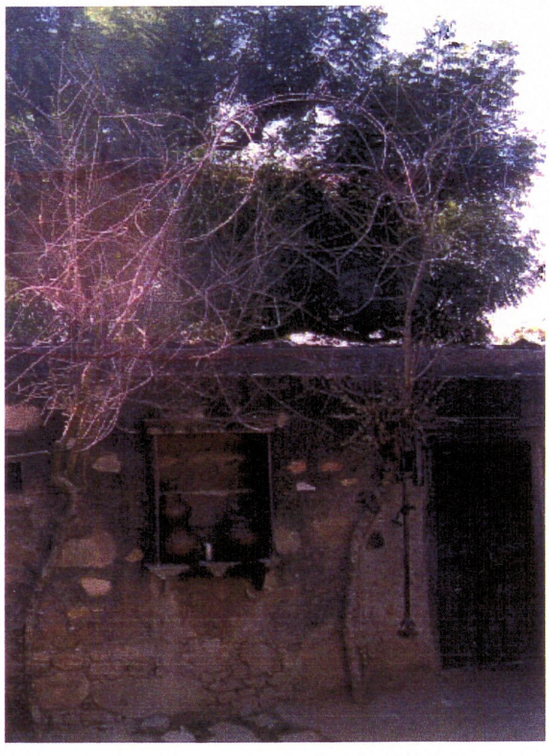
CHAPTER 3

CURRENT (KNOWN) RANGE AND BIODIVERSITY

3.1 State of Natural Ecosystems and Biodiversity

Biological diversity of *Alwar* is one of the most significant in the entire *Rajasthan* and even in India. Several thousand wild species of naturally occurring plant and wild species of fauna are found in this area. This is when a number of biologically rich areas of the district such as *Sariska* have not yet been completely surveyed and explored. This diversity is not only significant but is unique too. Many species of plants, which are endemic to *Rajasthan,* are found in the area (e.g. *Commiphora wightii*). A great range of medicinal plants and shrubs are found in the district. In the case of fauna also, endemism is high among groups like reptile and birds as well as invertebrates and insects.

Forests are distributed all over the *Aravalli* hill ranges of the district. The composition and density of the species vary from place to place. The total geographical area of the *Alwar* is 8330 sq km, 328 sq. km. (4%) of which is covered by dense forests and 806 sq. km. (10%) by open and degraded forests. In plain areas 476 sq. km. (6%) is covered by thorny scrub forest.



9. A Threatened and Red Data Plant *Guggal* (*Commiphora wightii*) planted as sacred in houses.

The present situation of natural ecosystem and its biodiversity in the district is extremely poor and so disrupted that it is difficult to even assess it properly. This destruction of biodiversity is being caused by many factors and reasons; but policies and laws introduced and enforced by government play a significant role in this regard. Droughts and desertification also affect and degrade biological biodiversity. The destruction of biodiversity is in turn producing adverse effects on the

climate and human welfare. Currently at least 3 percent of the recorded floral and faunal elements are on the threatened list. Many of them are on the verge of extinction. For example, among plants species, *Guggal (Commiphora wightii) and Phog (Calligonum polygonoides*) are on the verge of extinction. Similarly, many species of mammals such as Tiger, Leopard and Four-horned antelope (*Tetracerus quadricornis*) are threatened species. This should not surprise one, for in the last few decades, this region has lost about 70% of its forests. This happened due to abandoning of traditional conservation and management practices for natural resources and biodiversity. Habitat and ecological destruction through encroachment, hunting, wood stealing, over exploitation, poisoning by pesticides / insecticides and chemical fertilizers, displacement of indigenous species by exotics, mining and quarrying have all contributed to this colossal destruction. Almost all government policies, rules, regulations and schemes end up working in a negative direction, especially at grass root levels. Today, even in traditional system of natural resources conservation and management stand seriously deteriorated. The new value system and enforced state control over land have placed communities aside and away from the management and conservation of flora and fauna.

Since, there is no adequate past record of wild biodiversity for *Arvari basin* as well as *Alwar*, no one can say for sure as to how many species have already been lost. The process continues for a number of species and sub-species as habitats, which have scarcely been explored, continue to be destroyed (*Patel, 1997*).

In a preliminary survey of the ten villages of *Arvari catchment* that was conducted in December 2000, botanists, zoologists and local community persons were involved. The survey team (*Annexure* I) prepared an inventory of the natural flora and fauna of the *Arvari* region from both primary and secondary data sources. The floristic and faunal elements were analysed by the researchers (experts of flora and wildlife). Some plant samples were also collected from field and they were correctly identified by matching them with herbarium specimens in the Botany department, University of Rajasthasn, *Jaipur*. The status of the floral and elements has been given in the tables 1 and 2.

Table 1. Status of Biodiversity-Flora

(A = Abundant; C = Common; F = Frequent; R = Rare; V.R = Very Rare; Th. = Threatened / at the verge of extinction)

Life-Forms	No. of pecies	Occurrence (No.)					
		A	C	F	R	V.R	Th.
1.Trees	71	07	26	11	19	06	02
2. Shrubs	59	11	21	15	05	05	02
3. Herbs							
3.1 Annual	157	47	71	25	07	06	01
3.2 Perennial	99	21	47	18	04	04	03
4. Climbers /Creepers (Including Lianas)	49	13	22	05	04	03	02
Total	**435**	**99**	**187**	**74**	**39**	**24**	**10**
Other Plant Groups							
Ferns	3	-	2	-	1	-	-
Bryophytes	2	-	2	-	-	-	-
Fungi	4	-	-	-	4	-	-
Total	9	-	4	-	5	-	-

Table 2. Status of Biodiversity – Fauna

Class	Occurrence / Frequency					
	A	C	F	Rare	V.R	Total
1. Mammals	3	14	1	10	2	30
2. Birds	4	63	12	71	31	181
3. Reptiles	1	9	1	3	01	15
4. Amphibians	1	4	-	1	-	06
5. Molluscs	-	2	-	1	-	03
6. Insects	6	14	-	2	1	23
7. Butterflies	-	6	-	-	-	06
8. Spiders	-	4	-	-	-	04
9.Bees	-	1	-	-	-	01
10. Annelids (Earthworms)	1	-	-	-	-	01
Total	**15**	**117**	**14**	**88**	**36**	**270**

(Source: A *personal communication of Dr. Satish Kumar Sharma, an ornithobotanist and wildlife expert and forest official April 23, 2001 and he was also a part of the survey team. Further, the data has been verified from village communities during field survey)*

In the area, there are 435 flowering plants species, out of which 10 species are considered as threatened and 24 species are found very rarely. In the area, the lower groups are non-flowering plants like ferns, bryophytes and fungi are poorly represented (see detailed list in Annexure VIb).

There is rich diversity in animal world of the area, but 36 species of the animals are found very rare (see details in Annexure VIa). For last 10-15 years, village communities of some of the village have been making effort to regenerate the forest resources in their areas. The successful community efforts have regenerated forest resources and revived wild life in *Bhaonta-Koylala* and *Chaunshla-Padak Chhapali* villages. In other areas poor conditions of the natural forest is subjected to heavy pressure of grazing livestock.

Some patches in the hilly tract of the *Arvari* region are of semi-savannah growth. Locally they are called "Birs". Some areas are dedicated to local deity called sacred groves. The tree/shrub growth species found in these areas include *Anogeissus pendula, Prosopis cineraria, Acacia leuceophloea, Prosopis chilensis* (commonly known as *Juliflora), Acacia senegal, Salvadora persica* along with *Balanites aegyptiaca* and *Ziziphus nummularia*. The scrub growth consists of *Calotropis procera, Mimosa hamata, Cassia auriculata* etc. and the climbers found are: *Asparagus racemosus, Cuscuta reflexa, Abrus precatorius, Atlosia searataeoids, Blastenia fimbristipula, B. garcini, Cardiospermum halicacabum, Clitoria ternatea, Cocculus hirsutus, C. pendulus, Corallocarpus epigaeus, Cayratia trifolia, Ceropegia bulbosa, Cissamelos pareira, Citrullus colocynthis, species of Cucumis, Merremia aegyptia, Momordica balsamina, M. charantia, Mucuna pruriens, Mukia maderaspatensis, Oxystema esculentum, Pyrostegia venusta, Rivea hypocrateriformis* etc. The grasses found are *Cenchrus ciliaris, Songhum halepense, Apluda mutica, Desmostachya bipinnata, Saccharum bengalense, S. spontaneum, Dactyloctenium scindicum* and species of *Aristida* and *Eragrostis*. *(Based on field observations of Dr. O P Kulhari, Dr. R K Srivastava and Dr. S K Sharma, all taxonomists and Dr. Sharma as wildlife expert during field surveys).*

Some sacred groves are having rich biodiversity and local people take care to protect plant species. The productive potential of these areas is very good and

their proper management can further improve the productive status of these areas by local communities in confidence and ensuring their active participation.

3.2. State of Agricultural Ecosystem and Domesticated Plant / Animal species and Varieties

One of the important components of the biodiversity is the diversity in the crop species and varieties. The principle crops of the *Arvari* region are Pearl millet (*Bajra*), Sorghum (*Jowar*), Maize, *Sesame*, Pigeon pea and *Kali jiri* (only in *Thanagazi* block) in *Kharif* crops and Wheat, Mustard and Gram in *Rabi* crops. Local farmers created and perpetuated gene pools by natural selection. The "*Jhakharna*" variety of Bajra is being perpetuated through natural selection in the region.

Information about the traditional varieties and new varieties introduced is given in table 3.

Table 3. Information regarding biodiversity of crops

S. No.	Crop	Traditional variety
1.	Bajra	Jakharana
2.	Maize	Dholi, Sathi pilli, Pilli
3.	Jawar	Safed Lal
4.	Jou	Modia
5.	Sarso (Mustard)	Laturia, Lotani
6.	Wheat	Arjun, Farmi
7.	Chickpea / Gram	Pila channa, Ujjain 21, Dohad yellow

(Source: Sahkari Beej Bhandar, Thanagazi)

During village meetings the farmers expressed that although the *deshi* varieties of wheat cultivated by them earlier needed less amount of irrigation and was good in taste, the chapattis remain soft and believe it to be more nutritive and there was no requirement of artificial chemical fertilizers; only some farmyard manure was good enough. *Deshi* varieties of wheat are still grown in areas where adequate irrigation facilities are not available. Some farmers also mentioned that they grow *deshi* variety for their family consumption. Yet it had some inherent drawbacks, which are as follows:

- The yield was less.
- The plants were tall and in the month of March with strong winds in the area, they were susceptible to lodging.

Similarly, the local variety of *Bajra* is considered to be good because of its good taste and is very suitable for making *Khichri.* This is a preferred dish in the area especially during winters. The local variety also gives good fodder and its water requirement is also less in comparison to the new variety. However, the yield of the new variety is 2-3 times more than the local variety. Most cultivators prefer to grow the local / *deshi* varieties of Jawar, Maize and Barley because of the shortage of water for irrigation and secondly for their good taste and palatable fodder.

Improved varieties of mustard are generally cultivated. New variety, with the available amount of irrigation gives good harvest. Other advantage of the improved variety is that the seed does not fall. Early and late, both varieties give good harvest. This crop is more remunerative and less expensive.

The farmers also expressed that the use of the tractors instead of bullocks for ploughing the land, the soil results in superficial working of soil. The substratum of soil remains hard and is probably responsible for some of the soil borne diseases. The use of the tractor also uprooted a significant number of perennial plant species like *Desmostachya bipinnata*, *Saccharum spontaneum* that are completely disappearing from the area. The use of the pesticides / insecticides and chemical fertilizers is increasing which is causing adverse effect on soil micro flora and fauna. This is resulting into degradation of the natural fertility of the land.

3.2.1. Improved crop varieties

New improved and high yielding varieties of the crop plants have been vastly introducing in the region for the last few decades.

Introduction of these varieties have substantially increased the productivity of the crops in terms of grain / seed production but quality of fodder has not increased substantially or rather has decreased with the increased demand of water for the irrigation and chemical fertilizers for maintaining the fertility of the soil, needing new seeds every year from the market has made the farmers dependent on outside agencies.

Table 4. Improved varieties of Common Crops

Crop	Improved varieties
Bajra	RHB-30, RH-90, Raj-171, HHB-60, HHB-67.
Wheat	RR-21, Kalyan Sona, Raj-1482, Lok-1, WH-147.
Mustard	Varun, Pusa Bold, RH-30, PR-15, Bio-902.
Chickpea	RSG-44, GNG-147, GNG-663, G-130.
Maize	Ageti-76, Ganga-2.
Groundnut	RG-141, MA-10, M-13, RGB-87.
Sesame	RT-46, RT-54, RT-125.
Mungbean	RMG-62, RMG-268.
Cowpea	RC-19, FS-68, C-152.
Barley	RD-2035, RD-2052, RD-2503, RD-31.

(Source: *Sahkari Beej Bhandar, Thanagazi & Agricultural Research Station, Durgapura, Dr. D K Saxena & Dr. S M Bhatnagar*)

Table 5. A comparison of the mean crop productivity over sets of five years

Crop	Crop productivity (Kaha)		% Increase
	Mean of 1982 to 1986-87	Mean of 1995-96 to 1999-2000	
Pearl millet (Bajra)	298	380	27.5
Mustard	784	957	22.0
Wheat	1820	2567	41.0
Kharif pulses	147	201	36.7
Barley	1506	1996	32.5
Sesame	102	115	12.7

(*Source*: *RAU-ARS, Durgapura, Jaipur*)

Figures in table 5 show that there is a significant increase in crop productivity and the highest increase has been observed in wheat productivity i.e. 41 percent followed by Kharif pulses. It is due to the availability of high yielding varieties of these crops.

3.2.2. Vegetables and Fruits

As per the information collected from the 13 villages of the area, 46 types of crops are cultivated in the region and their status is given in the table 6.

Table 6. Vegetables

S. No.	Vernacular names	Latin name	Growing status
1.	Rayda / Tara-Mira	Eruca sativa	Common
2.	Jeera	Cuminum cyminum	Rare
3.	Rai	Brassica nigra	Rare
4.	Til	Sesamum indicum	Common
5.	Mung	Vigna aureus	Common
6.	Chawla	Vigna unguiculata	Rare
7.	Ganna	Saccharun officinarum	Rare
8.	Arandi	Ricinus communis	Rare
9.	Piaj (Onion)	Allium cepa	Common
10.	Lahsun (Garlic)	Alilum sativa	Rare
11.	Gehun (Wheat)	Triticum aestivum	Abundant
12.	Makki (Maize)	Zea mays	Common
13.	Bajra (Pearl millet)	Pennisetum typhoides	Abundant
14.	Jou (Barley)	Hordeum vulgare	Common
15.	Chana (Gram)	Cicer arietinum	Abundant
16.	Dhaniya (Coriander)	Coriandrum sativum	Rare
17.	Mirch	Capsicum annuum	Abundant (Padak–Chhapeli)
18.	Tamator (Tomato)	Lyeopersicon esculentum	Abundantly grown in Padak- Chhapeli village
19.	Methi	Trigonella foenum-graecum	Rare
20.	Somf	Foeniculum vulare	Rare
21.	Ajwain	Trachyspermum ammi	Rare
22.	Bengan (Brinjal)	Solanum melongena	Common
23.	Palak	Spinacia oleracea	Common
24.	Shakarkand (Sweet potato)	Ipomoea batatas	Rare
25.	Rijka	Medicago sativa	Common
26.	Mooli (Radish)	Raphanus sativus	Common
27.	Phoolgobhi (Cauliflower)	Brassica oleracea subsp. botrytis	Common (Jhiri)
28.	Bandgobhi (Cabbage)	Brassica oleracea spsp. Oleracea	Rare

29.	Tambakoo (Tobacco)	Nicotiana tabacum	Rare
30.	Gheeya	Lagenaria siceraria	Rare
31.	Tinda	Citrullus fistulosus	Rare
32.	Bhindi	Abelmoschus esculentus	Abundant (Sainthal Sagar)
33.	Sarson (Mustard)	Brassica campestris	Abundant
34.	Mungphalli (Groundnut)	Arachis hypogea	Common
35.	Singhada	Trapa natans	Rare
36.	Kamalgatta	Nelumbo nucifera	Rare (common in Sainthal Sagar)
37.	Jowar	Sorghum vulgare	Common
38.	Gawar	Cyamopsis tetragonloba	Common
39.	San	Crotalaria juncea	Rare
40.	Tarbooj	Citrullus lanatus	Abundant (Nimmi)
41.	Kharbooja	Cucumis melo	Abundant (Nimmi)
42.	Kakri	C. melo var. utilissimus	Abundant (Nimmi)
43.	Khira	C. sativus	Abundant (Nimmi)
44.	Torai	Luffa aciutangula	Abundant (Nimmi)
45.	Gajar (Carrot)	Daucus carota	Common
46.	Kali Jiri	Centratherum anthelminticum	Common (Thanagazi block)

(Source: Local communities during field surveys)

Some cultivated fruits and a number of wild fruits having good nutritive food and economic value grow in the region. Some of the important indigenous varieties of fruits of the area are as follows:

- *Mango*: (*Mangifera indica*) is cultivated in moist hilly parts and near water reservoirs like *Sainthal Sagar* in the region.
- *Jamun:* A variety of *Jamun Syzygium cumini* is cultivated rarely in parks and gardens. Its fruit is much valued for its taste and medicinal use.
- *Khajur* (*Phoenix sylvestris*) grows naturally on the banks of rivulet *Arvari* and in nallas and other moist places. Children and farmers like its fruits while they are working in their agricultural fields. The tree is a roosting site for the weaverbirds.

- *Sitaphal* (Custard apple – *Annona squamosa*) rarely occurs in natural forests of *Bhaonta-Koylala*. It is cultivated in gardens and kitchen gardens. The pulp of the fruit is sweet and nutritive.
- *Jangli Ber (Ziziphus nummularia)* grows gregariously in fallow and wasteland and forest areas. Cattle grazers collect the ripened fruits of this plant during the months of October and November and these have a high nutritive value. This species is fast declining due to increasing mechanised farming and growing of monoculture crops.
- *Ber (Ziziphus mauritiana*), a few varieties of this plant are cultivated for edible fruit.
- *Aonwla (Emblica officinalis*) is rarely found in natural condition but farmers of the area in recent years have started to grow its improved varieties on farmlands. The fruit is used in Ayurvedic medicines.
- *Kair (Capparis decidua)* plant is widely distributed throughout the area and un-ripened and young fruits of this species are used as vegetable and for preparing pickles. The dry fruits are preserved and used as a vegetable to be cooked later. The food and medicinal values of this fruit are high. The studies have shown that this fruit is rich in crude protein, fibre, iron, zinc, manganese and copper. These properties remain unaffected during processing of the fruit. No scientific study for the improvement of the fruit, its propagation, harvesting and processing has been undertaken which needs attention of the scientists. The Kair shrub is an important site for local and migratory birds. Wild ungulates and birds eat the fruit. In highly degraded areas, it provides shelter to small mammals from the scorching summer sun. This species normally grows on common village pasturelands, groves and farmlands. It is being over exploited for fuel wood and picking unripened fruits from the tree. It is fast disappearing from many areas due to the above reason.

Other important fruits occurring naturally in reserve, protected forests, or cultivated on agriculture lands or in kitchen gardens are:

- *Amrood* (*Psidium guajava*) is commonly grown in kitchen gardens and farm houses.

- *Gonda* (*Cordia gharaf*) grows naturally in dense forest.
- *Emli* / Tamarind (*Tamarindus indica*) occurs naturally in fallow and forestland and planted in parks, gardens and roadsides.
- *Piloo* (*Salvadora persica*) grows naturally in sacred grows; fallow lands, village common lands and field boundaries and gives shelter to wildlife.
- *Gangeran* (*Grewia tenax*) is found in natural state in dense forests.
- *Bel* (*Aegle marmelos*) grows naturally in forests and planted in the backyards of houses, parks and gardens.
- *Sangri* (*Prosopis cineraria*) is a common tree of the plain areas growing in agriculture fields. It increases the natural fertility of the soil.
- *Dansar* (*Rhus mysurensis*) grows gregariously at hill slopes and hilltop in the forest areas.
- Banana (*Musa paradisiaca*) is planted rarely in the backyards of the houses.
- *Kakar* (*Flacourtia indica*) grows in natural conditions in the protected forest of *Bhaonta-Koylala* and *Chausala –Padak Chhapali*.
- Papaya (*Carica papaya*) is grown rarely in the kitchen gardens only.
- *Falsa* (*Grewia asiatica*) rarely occurs in natural condition in the protected forests *of Bhaonta-Koylala*.
- *Bad* (*Ficus benghalensis*) grows in rock crevices and planted on community land near human habitation for shade.
- *Gular* (*Ficus glomerata*) grows naturally in the valleys of *Aravalli* hills.
- *Nimbu* (*Citrus lemon*) is planted in kitchen gardens and on farmlands only.

3.2.3. Domesticated Animals

Domestic animals make a major contribution to the economy of the people of *Arvari* basin. Animal husbandry is one of the main occupations, goats are reared by all castes / communities in rural areas but mainly Gurjar and Meena communities of the area rear buffaloes and cows for milk and sheep for wool

production. These animals also provide valuable manure for the agricultural fields. Some poor people also rear pigs for meat and hen / cocks for eggs and meat. Some of the indigenous breeds of animals found in the *Arvari* basin are much prized for their sturdiness, heat tolerance, disease resistance and for thriving in adverse habitat conditions. The important breeds of the region are:

Cow: Important breeds of the cows found in the area are *Haryana* and *Mewati*. *Haryana* breed possesses good milk strain and the males make good drought cattle. The raised head makes it look stubborn and majestic. The face is long and pointed and the forehead is flat. A perceptibly raised bone, in the middle of forehead is the characteristic sign of the breed. Nostrils are broad and black. Eyes are big and shining. Ears are comparatively small and have a slight drop. Horns are 12 to 20 cm long and shapely. They are almost straight when small but slope inwards when grown in size (BSAP *Aravali* eco region, 2002).

Mewati breed is valued as dual-purpose animal and for heavy plough and carting. They are mostly white in colour with a dark head. The cows give fairly good quantity of milk. They have long pointed face and raised forehead. The horns growing from the outer corners of the head with their points turned back is the principal identification mark of the breed.

Buffalos: Breeds of the buffalos found in the area are *Murrah* and *Surti*. *Murrah* breed is considered to be the best milk yielding variety of India. The animals of this breed have characteristically curled horns and have massive and stocky built with deep frame and short massive limbs. The average milk yield is about 11 kg per diem, which sometimes goes up to 14 kg. The fat content is high (about 7%). The male animal is placid, docile and slow worker but is powerful for heavy cartloads.

Surti buffalos are of medium size and the milk yield of these animals is not high.

Goats: Goats are reared for milk, meat and hides. Some goat breeds give high yield of milk. These animals, because of their ability to survive on meagre quantities of fodder, are reared all over the area. The animals graze in the forest areas. The most important breed of the goat in the area is *Jakharana*. This breed is found in *Jakharana* village in *Alwar* district. The breed is named after the village where it is found. The milk yield of this goat is very high and goes up to 8 kg milk

per day. The goat is black in colour with white spots around its eyes, face and ears. The milk yield of this breed decreases as one moves away from this village.

Sheep: Sheep rearing is an important occupation of the cultivators in single crop areas since they are engaged in agricultural occupation for only about four months in a year. Sheep and wool thus contributes substantially to the economy. The important breeds found in the *Arvari* basin are *Chokla, Nali* and *Malpura*.

Chokla breed is light or medium in weight. Dark brown or black patches that are considered as distinctive breed characteristics mark brown face. The tails and ears are of medium length. It produces good quality carpet wool. The ewes weigh between 30-40 kg.

Nali sheep is a brown-faced animal with medium to long leafy ears. It has a big sized body with good depth, short legs and yellow hooves. The tail is long and tapering. The body weight of ewes varies from 30 to 35 kg and that of ram between 32 to 40 kg. The wool is very greasy and the quality is medium to coarser. It is stained yellow.

Malpura sheep have long well built body with white or light brown face, colour often extending to the neck and the limbs. They have long bare legs, medium to long trails and small ears. The wool produced is very coarse and is suitable for manufacturing of namdas and small carpets.

Camel: Camel is used for transport of human beings and material to remote areas and is also used for pulling of specially designed camel carts in rural areas. "Rebaris" bring herds of camel for grazing them in the forest area during the lean period of the year.

Poultry: Local non-descript breed of birds, desi-murghi are reared in small numbers for domestic consumption all over the *Arvari* basin.

Fisheries: There are a few fishponds created by the Fisheries Department spread in the *Arvari* basin. Important among them are *Jamwa Ramgarh* in *Jaipur* district and *Sainthal Sagar* in *Dausa* district. Under the fisheries development scheme of the Govt., a number of exotic fish have been introduced in these water bodies without proper consideration of the requirement of indigenous fish. This introduction has adversely affected the local species. (Detailed information is not available. There is a need for systematic study).

CHAPTER 4

STATEMENT OF PROBLEMS RELATED TO BIODIVERSITY

4.1. Domesticated Biodiversity

4.1.1. Loss of Traditional Crops: Traditional cropping patterns have changed drastically in the last few decades. The production of the traditional varieties of crops like *Bajra*, Maize, *Jawar*, Barley, Wheat, Gram, Pulses have suffered adversely because of:

- Development of irrigation facilities by construction of medium and small-scale projects and tapping of ground water for agricultural purposes increased the area under irrigated crops. The area under traditional crops such as *deshi bajra* (pearl millet), maize, pulses like mung has reduced and has been taken over by high yielding hybrid varieties of wheat, bajra and pulses which even though require more water.
- In traditional agriculture there was mixed cropping pattern in which both cereals and pulses were grown together. Even there were chances to have some production of one of the crops when monsoon rains were insufficient or any other climatic disaster occurred. But now monoculture pattern of crops sometimes brings zero yields, which causes great loss to the farmers.
- Cultivation now is driven by market and consumer demands, so there is no market available for selling surplus production of pearl millet (Bajra). Therefore, farmers are forced to cultivate more wheat.
- Increasing demand of food grain production and the inability of these crops to cope up with the growing demands. This resulted into introduction of high yielding / hybrid varieties. The public distribution system helped in changing the food habits of the people by providing wheat at cheap rates.
- The government policies of promoting the high yielding varieties by providing seeds, fertilizers and pesticides / insecticides at subsidized rates.
- Even in *'Food for work programme'* executed by the government, wheat is distributed in place of wages in Maize and *Bajra* eating people. This resulted into changing food habit of the people.

- Easy availability of wheat at cheaper rates reduced the consumption of coarse grains such as *Bajra, Jowar*, and Maize etc.
- Contract (*Thekka)* for cultivation of *Kamalgatta* (*Nelumbo nucifera*) in *Mathawali Nadi* near *Sainthal Sagar* has been given to outside people by Govt. deptt. for last 5-6 years. Local people even do not use *Kamalgatta* (*rhizome)* as vegetable and are not aware of its use. They say that this plant is causing water pollution. Further, local community is not involved in the contract giving process and the revenue collected from this is not used for the local resource development.



10. *Kamalgatta* (Lotus) cultivation

- Crops like pulses and *Gawar* (*Cyamopsis tetragonoloba)* are more susceptible to damage by blue-bull (N*ilgai*). The farmers avoid growing these crops in the area because the population of *Nilgai* is significantly high.
- Debris from blasting and drilling in marble mines of *Jhiri* and *Kalsi Kala* villages has coated crops and smothered forests.
- Mines operating 100 ft underground have also disrupted water table on which local wells and irrigation rely.

4.1.2. Domesticated Animals

Some significant reasons for the loss of domesticated animals are:

- Fast growing population of the area is bringing more and more land under cultivation, mining, industries and human habitation / urbanisation. As a result of this, the forest grassland areas are decreasing at a fast pace. This is causing reduction in the population of the cattle mainly cows, goats and sheep.
- Mechanization of agriculture has reduced dependence on bullocks and camels for ploughing of fields and transportation of the agriculture produce and other things. Therefore, these animals are being neglected.
- Development of infrastructure, particularly construction of roads and rural electrification is reducing the role of animals.

4.2. Wild Biodiversity

4.2.1. Forests

During the field survey, focussed group discussions with community members, women's groups were held and opinions and perceptions of the participants were elicited by asking some open-ended or semi-structured questions related to the management of community resources, social issues and status of women, deprived groups and children in the society and conservation of the biodiversity. The efforts were made to know about some common issues related to forest, wildlife and biodiversity conservation between village community and officials of the forest department. The issues and conflicts between forest deptt. and the community people that emerged from the interactions were as follows:

- The rights towards sustenance of the livelihoods of the inhabitants of the forest area have been restricted or almost finished under the Wildlife and Forest Conservation Acts. Therefore, for any activity performed by inhabitants even when meant for their basic need is stopped or banned by any forest personnel. For this sometimes, community resists, sometimes the conflict causes tension between the two groups. Taking *Bhaonta – Koylala* village as a specific example which has been affected by the Wildlife Protection Act and Forest Conservation Act; the villagers have been restricted to sustain their livelihood due to these existing new laws as they were mostly dependent on forest. But now the same community, with their initiative have built *Bhairon Dev* Sanctuary and are protecting / managing / conserving the forest and even fulfilling their basic needs from the forest by adopting community based norms and values.
- Community now, does not have any feeling of ownership and responsibility to protect and conserve the forests because the forest department personnel realise that they are the owners of the forests and bear the sole responsibility for the forest. They many a times treat the inhabitants of the area badly. This indifferent attitude of the forest department foresees the community people to consider forest is no more their thing and they start trying to snatch as much as they could. This makes the conflict situation quite grim. Some of the forest *chowki* (Naka) people several times take bribe (Rs. 100/-) to pass a truck loaded with wood. On the other hand, in recent years, many forest personnel in the area are taking positive initiative

to have more community and NGO participation in forest conservation and management, which has helped in reducing the existing conflicts. In coordination with local community and NGO, the forest department has got success in regeneration of forests.

- There were several traditional conservation system and practices in the village community but that were not taken care of while formulating policies and laws related to biodiversity conservation. Even today that are being neglected by government officials these arose conflicting situation several times between forest department and village community.
- In hilly and forest areas, the main livelihood source of the people is animal husbandry and the woods as main source of fuel for cooking their meals. They face acute shortage of fodder and fuel during summers, winters, and are forced to cut green trees in the forest area, which creates conflicting situations between the forest and the village community.
- Over-grazing creates adverse impact on the natural regeneration of the forest vegetation. It also limits fodder availability during drought period.
- Due to diminishing traditional practices such as leaving fallow land, self-maintaining system of the community which used to have checks and balances towards the fodder stock and grazing allowed more than that of the carrying capacity of the land.
- Almost all "birs" (grasslands) and sacred groves in the region are under the control of the State Forest Department. These grasslands, because of neglect and mismanagement are now in a badly degraded stage. The areas are overgrazed and heavily infested with Vilayti babool (*Prosopis chilensis)*. Unfortunately, the Forest Department did not realize the importance of these birs in the village economy. In plantations done in this areas could not survive except *Prosopis chilensis*. The thickets of this plant have adversely affected the growth of herbaceous flora. The areas are subject to uncontrolled grazing. Unpalatable weeds are therefore replacing the palatable species of grasses and other plants. The grasslands are loosing their productivity.
- An exotic tree species, Vilayati babool (*Prosopis chilensis* - earlier known as *P.juliflora*) promoted by the Forest Department on a large scale for last several years, now has been spreading at an alarming rate all over the area and causing acute trouble to the village communities. People want to

get rid of this plant and appealed to govt. authorities to launch a mass campaign for uprooting the entire population of this tree from the area.

4.2.2. Wild Animals

Main causes of loss of wild animals in the *Arvari* basin are as follows:

- Increase in human population had increased the demand of agriculture land, which ultimately leads to decreased forest, and pastureland. This affects the natural habitat of wild animals.
- A significant number of biotic elements are getting threatened or are at the verge of extinction due to a large scale quarrying activities, illegal hunting of birds and other wild animals in the area mainly around *Jhiri* and *Sainthal Sagar*.
- The population of Vulture, Eagles and Hawks has drastically reduced in the last 5-10 years. Villagers don't know its reasons, but believe that it is perhaps due to excessive use of chemical fertilizers, pesticides / insecticides in agriculture.
- Illegal hunting of migratory birds in *Sainthal Sagar* by outsiders is causing heavy loss of biodiversity in the area. Even local community is not making serious efforts for stopping the killing of the birds because the ownership of the *Sainthal Sagar* is of Government.
- Survival (livelihood) problems have come up in marble mining areas around *Jhiri* village, especially in *Kalsi Kala*, badly affecting wildlife, forests, agriculture and ground water resources in the area. The village people suggested that either the entire village be shifted to some other suitable place or quarrying activities be stopped.
- Increasing population of *Nilgai / Rojda* is causing heavy damage to the crops of the villagers. Therefore, they feel that the govt. should take appropriate measures to control their population or allow their killing on a limited scale.
- There were many religious traditions among community related to biodiversity such as sacred groves (*Orans*) and *Dharadi Pratha*. Sacred grove is a piece of forest land dedicated to local deity, in which local community does not allow to cut trees and kill animals. *Dharadi Pratha* is a traditional system to conserve trees and animal species in which different castes (*gotras / clans*) and tribes were prohibited from cutting particular

trees and killing animal species. In recent years, these traditional practices and local wisdom of the community towards symbolic forest and wildlife conservation has become a forgotten trend among new generation.

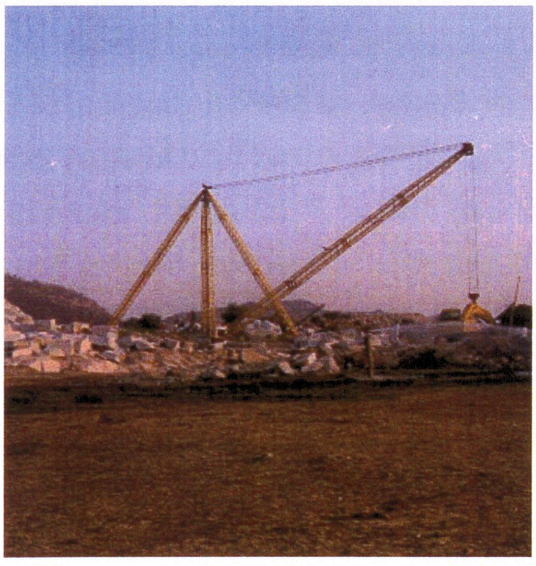
- Overgrazing and over exploitation of tree species was observed in the area. The consumption of biotic resources is much more than that of the carrying capacity of the village land.
- Continuous drought conditions for last 3-4 years have reduced the richness of the biodiversity.
- Village community is not able to maintain the old traditional water harvesting structures for example *Sainthal Sagar*, the entire cess collected goes to government and not utilized for maintaining the resources and no community involvement is taken in the process.
- Hunting of animals by professional communities like *Bawarias, Kalbalias, Kanjars, Sansis* etc has been observed in the area, which causes loss in the population of wild animals.

4.2.3. Mining

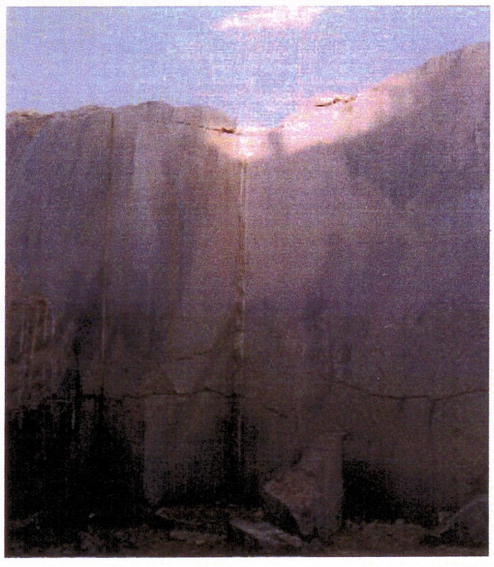
The Hidden Cost - The Effects of mining on people and the environment : Mining is often touted as being an industry that brings with it unlimited benefits for the people in the surrounding areas. Job creation, increased wealth and improved infrastructure are some of the benefits. *But what is the real cost to the people and the environment?* Mines radically alter the look of an area. Trees are removed, pits are dug, unproductive pits are left untreated, roads are laid and heavy machinery is moved in the area. This instantly creates increased noise and dust pollution along with a rise in the number of motor vehicles in the area. All of this has an adverse effect on the wildlife present in the area particularly on the biodiversity and more vulnerable species. And then the blasting begins creating yet more disruption and destruction. What was once pristine forestland is rapidly turned into a wasteland devoid of wildlife. Added to this is the overburden from the mines that is left in huge piles close to the mines area further blighting the landscape. In *Alwar* district of *Rajasthan* state not only the forest area but also *Gair Mumkin Rada* and all the area of *Sariska Tiger Reserve* and in *Jaipur* district *Jamuwa Ramgarh Sanctuary* is notified in the Wildlife Protection Act 1972 as prohibited area but still mining is being

undertaken in this area. Quite apart from the violation of the effected villagers right to livelihood, habitat, environment and wild life animals.

The Government policies regarding sanctioning of mines to the private contractors are seriously neglecting environmental and biodiversity issues. Presently, a large number of marble mines are operationalised in the area and they are causing heavy loss to the biodiversity (both natural and domesticated) and local communities are facing survival problems. The mining operations in the area are not good to the well being of the local communities, biodiversity and survival of natural resources. Especially in villages around *Jhiri* and *Kalsi Kala* village, marble mining operation is affecting badly the agriculture and water (even ground water) and the government department is not realising the severity of the problem.



11. Marble minig at *Jhiri* village



12. Untreated Marble mine pits causing casualties

CHAPTER 5

MAJOR ACTORS AND THEIR CURRENT ROLES RELEVANT TO BIODIVERSITY

Different sections of the society are stakeholders in the natural resource management and conservation of biodiversity. The major actors and their roles are discussed as follows:

5.1. Local Communities

Classification of the major actors has been worked out to know different sections of the community having different utilization patterns, conservation options and priorities about biodiversity. Based on the perceptions of the people, the village population can be classified into ten user groups on the basis of their relationship with the existing biodiversity. The most significant feature of the user groups is that all user groups are related with agriculture and animal husbandry directly or indirectly as well as cultural, environmental, religious, subsistence and medicinal value of biodiversity (Singh, 1997).

(v) **Farmers:** About 80 % households of the area are engaged in agriculture and animal husbandry and they have 1.0 – 3.5 hectare land evenly distributed. They use small timbers for their agricultural instruments and roof of their houses. They cultivate maize, bajra, mustard, gram, wheat, tara-mira (rayda) and tobacco. The farmers by adopting community control over cutting of forests create both negative and positive effects on the biodiversity. The positive effect in the sense that they help in protection of forest, organic manure and negative effect in the sense that they are meeting their basic demands for small timbers from the forest by cutting of trees for making their agricultural and household implements. The negative effect was more than the positive on the biodiversity in past but now it is getting reduced.

(ii) Pastorals: This is the second biggest user group of biodiversity. Almost all households of the area have some domestic animals. The main activity of the pastorals group is grazing cattle. The majority of the cattle are of goats and sheep. The excessive grazing in particular parts of the forest creates negative impact on the biodiversity of the region by damaging the natural regeneration of the

vegetation. In lean months they cut branches of trees for providing green fodder to their livestock. Positive effect is in the form of seed dispersal and providing manure (dung) by the cattle population. This group has special knowledge about specific use of wild plants species like medicinal value and conservation techniques of the natural resources. Some groups of Shephard from outside the area come in the area for grazing their cattle herds. Sometimes, this creates conflicting situation between local communities and migrants. It has also negative impact on biodiversity.

(iii) Fuel wood collector: The user group mainly comprises of rural women, farmers, pastoralists and pot makers (*kumhars*). Mainly women collect dry and fallen wood from the forest for their own use for cooking food whereas the pot makers (potters) use firewood and cattle dung to bake their earthen pots. The bulk of the earthen pots known as '*Aawa*' is burnt in '*Upla*" (prepared from cattle dung) and with dry litter and wood. Mostly, male pot makers perform this activity. The pot making work has commercial value whereas women of the area collect firewood for subsistence. Some times, this user groups cut green branches of the trees and after drying these they collect and take them. Therefore, this group produces negative effect upon the tree growth in the area.

(iv) Fodder (Grass) and Green Manure Collector: Members of the pastoralists and farmers have perfect knowledge about the nutrient value of the green fodder; yield plants and grasses, their ripening, conservation and propagation techniques. They cut these grasses when they have produced seeds so that next year these grasses grow very well and also store these grasses and foliage part of fodder yielding trees for the lean months. Green leaves and small barks of various plants and trees are also collected and used as green manure in agriculture fields. This biodiversity has natural and subsistence value. All communities mostly avoid the commercial use of these products. The cutting of fodder grasses in forest areas is performed with the permission of the forest department after deposing of certain royalty (tax) with the forest department. Mostly women are invariably involved in cutting and collecting of grass and manure.

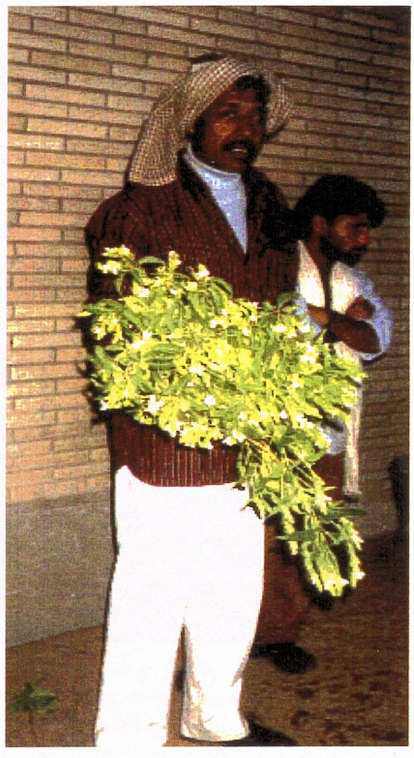
(v) Wild vegetable and Fruit Collector: This is comparatively a smaller group, which includes landless people, women and children of small farmers and cattle grazers. The members of this group have knowledge about wild vegetables, fruits and other edible parts of plants, their flowering, fruiting, ripening and use periods, nature, taste and nutrient values. They make use of these wild collections in

getting vegetables; pickles can be stored for a long period. These products have subsistence, cultural and environmental value.

(vi) Herbal Healers, traditional village Vaidyas (*Gunis*) and *Dais*: Several people of the area know the traditional medicinal uses of the naturally occurring plants and they use them for treating several common ailments of both human beings and animals. The commercial exploitation of these herbal resources has not been observed in the area. But many outsiders, traditional healers collect some herbs sometime for preparing Ayurvedic medicines. Medicinal, cultural and religious value of these herbs is prominent having no negative effect upon community but positive effect is seen because people who are knowledgeable collect plants, their seeds, roots etc. and regenerate them in the farmlands, parks and kitchen gardens and nearby their hamlets.



13. Herbal healer preparing medicine from plant materials.



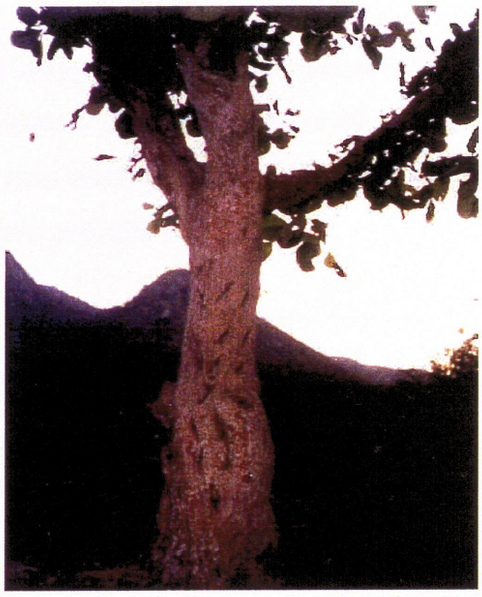
14. A medicineman collected *Vasaka (Adhatoda zeylanica)* plant from field.

(vii) Village priests from the communities and Naths: There are a significant number of temples, and households associated with them whose livelihood mainly depends upon income generated from these temples. They promote several plant species to grow in the premises of the temple. Parts of these plants like leaves, twigs, bark flowers, fruits etc. are used to offer to the deity. Some plants are grown for their aesthetic / ornamental, religious, medicinal and shade purpose. The major village communities associated with the religious places are *Brahmins* and *Naths* and more or less they depend somewhat on income from temples, offered by worshippers / visitors and other religious activities. Overall these communities

produce positive effect upon biodiversity extending cultural and religious feelings amongst inhabitants.

(viii) Labourers or Seasonal Migrants: Different development and conservation work performed by the Forest Department provide few persons as day labour for local inhabitants mainly males in the area. But a large area is affected by marble mining activities in which a significant population of marginal farmers and landless labourers is engaged in quarrying activities. These labourers exploited plant resources for meeting their needs of fuel wood and fodder. This creates negative impact on the existing biodiversity of the area.

(ix) Gum Collector: This is rather a smaller group of mainly of children (both boys and girls) of cattle grazers and forest dwellers who are engaged in cattle grazing activities. They collect some gum from the forest and farm trees like Dhak (*Butea monosperm*), Khairi (*Acacia Senegal*), Khajri (*Prosopis cineraria*), Deshi babool (*Acacia nilotica*) etc. for their own family's use and this also fetches some supplementary income to the household. But these children have knowledge about gum producing trees having mainly subsistence value as well as cultural value to a less extent.



15. Scars on tree trunk : unscientific means of extracting gum from *Dhak (Butea monosperma)*

(x) Artisans: Artisans of the area comprises different categories of the rural community like carpenter, pot maker, shoe maker, barber, ironsmith, gold and silver smiths, basket makers etc. The population of these categories of artisans is not too high but a significant for biodiversity point of view. People of these



16. Plant materials used in Basketry : *Dansar* (*Rhus mysorensis*), *Gangaren* (*Grewia tenax, G.fraviscence*) and *Bonwalia* (*Acacia jacquemontii*)



17. Broom making from *Jangli Khajoor* (*Phoenix sylvestris*) fronds.

categories have the specific knowledge about their activity and use of biodiversity-viz., carpenter about wood/timber for making furniture, barber about leaves for preparing '*Dona*' and '*Pattals*', potmaker about fuel wood and cattle dung for baking earthen pots and shoemaker about tannin yielding plants for tanning leather, iron/gold/silver smiths for good heat producing charcoal making woods.

The value of the activities performed by these categories is cultural nuisance and commercial cum subsistence to relative biodiversity and these activities to some extent create negative impact of the plant resources of the area.

(xi) Community: Village community being the major actor has undertaken several initiatives that have been discussed in Chapter 6.

The communities living in the villages are aware of the importance of the trees, forest and biodiversity. The indigenous systems of management of forests (especially) villages of *Thanagazi* block (*Alwar)* was evolved long before colonial times therefore some traditionally adopted practices are still prevailing.

Box 4.

SACRED GROVES

The traditional practices of forest conservation (sacred groves) in the area are

Kakad Bani is a forest patch on common geographical boundary of two or three villages. This practice is quite common, occurs almost in all sampled villages. The responsibility for protecting this area was shared between these villages. This area was used for controlled grazing and harvesting *minor forest products*, but no felling/lopping of trees was allowed except by a joint decision.

Rakhat Bani is a forest area, which belongs to a single village; the village itself regulated access to an exclusive common resource for the village. This resource was used only during the periods of scarcity, famine and droughts.

Dev Bani / Orans (Sacred groves) were forest patches found almost in all sampled villages dedicated to local deity. The village community religiously protected these.

Dharadi Pratha was a traditional system for biodiversity (plant and animal species) conservation in which different castes and tribes were prohibited from cutting trees for use as timber and fuel wood, different *Gotra* (clan) protect particular species.

Animals and Plants associated with origin (genesis) of the castes / classes as believed by local communities are not allowed to cut or hunt and the plant species belonging to particular caste or clan is planted nearby their habitation.

Table 7. Plants and Animals associated with different castes and clans

S. No.	Plant / Animal	Caste	Clan (Gotra)
1.	*Bad (Ficus benghalensis)*	Gurjar, Rajput	Chhabadi, Doi, Toongad, Koli, Rajawat, Kushwaha
2.	*Kadamb (Anthocephalus cadanba)*	Sharma, Gurjar Yadav, Meena, Saini (Mali)	Panchaala, Poswal, Kasana Jojadiya, Gunwal, Vyadwal, Oochwaas
3.	*Ashok (Polyalthia longifolia)*	Meena, Brahmin, Rajput	Tapawas, Jhadoliya, Hada,
4.	*Belpatra (Aegle marmelos)*	Gurjar	Dadgas
5.	*Roheda (Tecomella undulata)*	Gurjar	Koli
6.	*Neem (Azadirachta indica)*	Sharma, Rajput	Upadhyay, Rathore
7.	*Cam (Holoptelea integrifolia)*	Meena	Jef, Chidawat
8.	*Peepal (Ficus religiosa)*	Rajput, Sharma, Chandela	Chauhan, Balan, Chandel, Bhardwaj, Beriwal
9.	*Babool (Acacia nilotica)*	Raigar	--
10.	*Khejri*	Sharma, Rajput, Jat	Pankhwadia, Sisodia, Bisnoi
11.	*Chinar*	Secular community	Sadhu
12.	*Farah / Faras (Tamarix sp.)*	Jat	Johiya
13.	*Mor* (Peacock)	Jat	Bisnoi
14.	*Lomadi* (Fox)	Mahor	Tapawas
15.	Honeybee	Gupta (Vaisay)	Khandelwal
16.	*Heeran* (Deer)	Bisnoi	--

(Information provided by local old persons, schoolteachers and persons associated with worshipping place like temple from the villages during fieldsurvey and secondary source: Prof. Mohan Shrotriya (1997), Dharadi- Naye Sandarbh Mein).

In many of the villages of the area as observed during the field studies, these traditional practices of forest conservation are still prevalent but now this trend is declining.

5.2. NGO

Tarun Bharat Sangh (TBS), a grass root NGO has been working with the village communities for the last 20 years and mobilising people for their own common resource management and building their capacity for the same to make them self reliant so as to achieve the bigger goal of " *Gram Swaraj*". TBS believes that only community can manage, conserve and save wildlife and biodiversity. With this belief TBS initiated different people's movement; launched "*grow tree, save tree*"; yatras; beginning from the day of *Rakshabandhan* by tying thread to the trees; "*save water, construct Johad*" yatras begin from *Dev Uthani Gyarash*;

"*Ganga, Gangotri*" yatras for awareness creation towards saving wildlife, forests and rivers and promoting a community based movement towards floral, faunal and water conservation in the region.

- Mobilised people at a common platform and constituted village institution and geo-cultural boundary level institutions like formation of *Arvari Sansad*, *Gram Sabhas* (*Lok Samitis*), Women's Self Help Groups (SHGs) and creation of village fund for sustenance of the development activity, nature camps for school children and students.
- Disseminating experiences of success stories amongst larger sections of the society all over the country and abroad for the replication of the community based initiatives. In last one year about 70,000 persons visited TBS project area and got exposure of community based approach of bioresources development. (*Source: Annual Report of TBS, 2001-2002*)
- Supported to construct and renovate about 5000 rainwater-harvesting structures in nine districts of *Rajasthan* (*Annual Report of TBS, 2001-2002*) and about 250 structures in *Arvari* catchment.
- Organised regular sammelans / workshops / seminars / orientation courses for the people of different sections of the society (including members of PRIs, Women's groups, NGOs and government officials and grass root workers, development planners, administrators, researchers etc.) and also discussed government policies and regulations regarding water and forest resource management and recommendations were sent to the government for necessary amendments in the existing framework.
- TBS had a long fight against mining since 1987 and organised anti-mining campaigns for stopping quarrying activities in the reserved forest and rich in biodiversity.
- Filed PIL in Supreme Court in May 1991 and also got final verdict in favour of stopping mining activities in and around protected areas.
- Supported people's non-violent movement (*satyagrah*) for closing mining (1993) and conducted a long foot march (*Padyatra*) to save Aravalli (Oct. 1993).
- Organised anti-poaching campaign in nearby reserve forests (*Sariska Tiger Reserve* and *Jamwa Ramgarh Sanctuary*) and established a dialogue with people involved in the poaching activities and some poachers were motivated them to become Tiger and Wildlife protectors.

5.3. The Government

The government (both State and Central) is a major stakeholder and actor on the issue of biodiversity. Activities of different departments are directly or indirectly concerned with the issue of the biodiversity of the area.

5.3.1. Forest Department

The department is mainly responsible for managing forest resources and increasing the productivity of the existing degraded forestlands. It has been taking the following steps in this direction:

- Raising of plantations of both local and exotic species for meeting the basic needs of local community mainly for fuel wood.

Box 5.

***Vilayati Babool* as a Troublesome Plant for Villagers**

Forestland in which forest department has made a plantation of *Vilayati babool* or locally known as *Juliflora* (*Prosopis chilenesis*) on several hectare of forest land in several villages of Jamwa Ramgarh block of Jaipur district. The villagers consider this plantation useless, rather causing troubles for them. *Vilayati babool* is a medium sized, evergreen tree having fast and dense growth all around in the village and forestland. Before the plantation of *Vilayati babool*, grass and desi plants were growing which were useful for grazing by village cattle. But this *Vilayati babool* is unpalatable as cattle do not graze it and does not allow any plant growth under its shade and nearby. It also damages crops. The villagers consider, "this plantation destroys local environment and flora. The forest department plays gamble with the village community in the name of plantation. They should have grown useful plants like grass, creepers, indigenous trees like desi *babool*, bamboos etc.".

This plant is causing serious problems and heavy losses to the village people. There are several examples, which prove its negative impact. Thorns of the plant are long, strong, stiff, and sharp and do not degrade for a long time. When a thorn strikes with the body of human beings and animals by accident, it causes wound and in a short duration this wound becomes severely septic. Several animals die. The affect of its thorn on human body is considered more poisonous than the stinging of a scorpion. Impact of these thorns with the tyre tubes of the village tractors causes damage to the tube. This happens frequently and the villagers have to take the tractors 4-5 km to get the tubes repaired which causes both economic and time loss. The villagers are making effort to destroy this plant but they say *"इसको जितना काटो उससे चौगुना बढ़ता है। अतः ऐसी कोई मशीन हो जिसके द्वारा इसको जड़ से उखाड़ा जा सके या ऐसी कोई दवा हो जिसके छिड़काव से यह पूरी तरह से नष्ट हो जाए। तभी गॉव वासियों को राहत मिल पाएगी।* (If one cuts this tree, it grows four times. Therefore, it should be uprooted or destroyed totally by a machine or by spraying a chemical). The villagers do not know how to eradicate it. Either government or some other agency (NGO) should take responsibility for eradication of this. They are ready to give help in this activity) ".

- Regenerating the local perennial plant species on degraded lands by making fencings.
- Involving the local village communities through Joint Forest Management.
- Increasing the production and availability of Non-Timber Forest Produce (NTFP) (e.g. fodder grasses for cattle).
- Encouraging farm and agro-forestry by making available suitable plants for the purpose.
- Improvement of tree species by selection of suitable "plus trees" through seed collection and raising seedlings. As the field experience shows that the above steps are not being implemented practically in the sub-state by the department. The plantation of one of the exotic species, *Vilayati babool* (*Prosopis chilensis*) is causing havoc with the local flora as the tree has allelopathic impacts and does not support undergrowth of flora and fauna. The need to shift from exotic monoculture plantations to mixed plantations or regeneration of existing native species has been realized in the past decades. The department is however, not giving due importance to the tree improvement research for genetic improvement of selected species, using biotechnology.
- With the support from TBS, the forest department is involving local communities in the construction of rainwater harvesting structures on the forest land which is promoting to flourish wild animals in the area.

5.3.2. Wildlife division of Forest Department

The department is presently providing protection to the wildlife and restoration of their habitat. The sub-state area is lying in semi-arid region of the state where availability of drinking water for the wild animals was a perpetual problem in the past. The department did not make much progress in creation of new waterholes and improvement of the existing ones but local villages communities with the support of NGO – *Tarun Bharat Sangh* created several water harvesting structures, which, partly solved the problem of drinking water for wildlife. It seems sometimes that there are gaps between the understandings of local community, forest and wildlife departments regarding the issues of resource management on forest lands and therefore, local community faces problems for constructing more water holes on the forestlands.

Increasing population of some wild animals species particularly *Nilgai* is causing heavy damage to the crops of the villagers. Therefore, the people of the area have been demanding from the government for initiating any effective measure to check their population for last few years.

5.3.3. Agriculture Department

The main aim of the government policy is to augment the agricultural production. It has played a rather passive role on the issue of agricultural biodiversity. In fact, the department has indirectly acted against the interest of biodiversity in agriculture. The policy of promoting a few crops by providing subsidised loans to the farmers, a good price on production, mechanization of agriculture, promotion of high yielding varieties and intensive use of chemical fertilizers and pesticides / insecticides are major causes of loss of faunal and micro biodiversity. Although, the department encourages the farmers for balanced use of fertilizers and integrated pest management approach; it is also trying to enforce judicious use of ground water through sprinklers / drip irrigation, but the approach is quite indifferent in the area since most of the farmers are marginal and they have not been trained properly in the new technology use. The department however, does not provide any incentives to the farmers for growing indigenous varieties of crops and land races. Most of the norms do not seem relevant to the present context and need drastic changes to make them relevant to the present day's ground situation.

5.3.4. Animal Husbandry Department

At present, the emphasis of animal husbandry department is on the improvement of the breed of the cattle. In the past, the policy of the animal husbandry department was to improve the productivity of local/indigenous variety of cattle by cross - breeding it with high yielding exotic varieties. This policy has failed in the area because of non-availability of nutritive fodder and veterinary care where the crossbreed is reared for dairying. The animal husbandry department is now emphasising on selective breeding of indigenous breeds by artificial insemination. The implementation of this scheme in the *Arvari* region is very poor and in almost all communities throughout the area, local / indigenous varieties of the cattle are reared on their own.

5.3.5 Fisheries Department

The rivulet *Arvari* began to flow for the full year in 1994 and new life was given to the river by local communities but the State government claimed right on the river waters. The fishing department of the state government gave contract for fishing in river waters. The village did not allow the fishermen to fish and they agitated against the policy of the state government and fought for their rights continuously for two years. On January 28, 1997, people of *Hamirpur* and nearby villages assembled and declared "*Satyagrah*" against the fishing contract given by *Rajasthan* Government. Finally people won their fight and the government withdrew its decision and cancelled the contract for fishing. People insist on the principle of live and let live in relation to the fish and call it *Jeeva Daya* i.e. mercy for every living being. But the government policies do not care for people's aspirations, feelings and community collective decisions. The cess collected from the fishing contracts in *Sainthal Sagar* is hardly utilized for the maintenance of water reservoir and its development. In its management, the local community is not involved.

The main emphasis of the fishery department is on setting up of hatcheries for increasing the production of fish, mostly the exotic species. The emphasis is also on increasing the fish seed and its production. Near *Sainthal Sagar* all hatcheries are lying unproductive. There is no programme of increasing the indigenous varieties of the fish.

5.3.6. Horticulture Department

The horticulture department provides information on existing vegetable and fruit species, subsidises to marginal farmers for growing new and improved varieties of fruit yielding plants, and orients the cultivators in using the techniques of growing these varieties. The scientists and concerned horticulture / agriculture extension officers of the area visit the farmers' field and demonstrate the techniques of planting the seedlings and use of pesticides and fertilizers. The department has been promoting especially the new varieties of *Aonwala, Ber, Nimbu* in the area. This initiative has generated self-employment and increased additional income among small and marginal farmers.

CHAPTER 6

ONGOING BIODIVERSITY INITIATIVES

Alwar district lies in the Aravalli hill ranges and dense forests that covered this watershed were an integral part of the rural economy until the 1930s when the colonial government abolished communal rights of forestland and allowed timber companies to exploit their resources. Presently, the forests are not uniformly distributed in the *Arvari* catchment.

6.1. Policies and Laws

National Forest Policies and Environment (Protection) Act enunciated by the Government of India from time to time have played an important role in the management and conservation of forests all over the country including all states. *Aravari basin* is directly effected by the notification issued by the Government of India in 1992.

6.1.1. Notifications

The *Ministry of Environment and Forests, Government of India issued a notification* on May 7, 1992 and cited following regulatory framework:

- Under *Environment (Protection) Rules 1986* restricting certain activities in specified area of Aravalli Range, which are causing Environmental Degradation in the region.
- A Notification under the Environment (Protection) Act, 1986 inviting objections against restricting certain activities in the specified area of Aravalli Range, which is causing Environmental Degradation in the Region, was published in the *Gazette of India*. In exercise of the powers under the Environment (Protection) Act, 1986 (29 of 1986) the Central Government hereby prohibits the carrying of the following process and operations, except with its prior permission, in the areas specified as follows:
    - (i) Location of any new industry including expansion modernisation;
    - (ii) (a) All new mining operations including renewals of mining leases.

(b) Existing mining leases in sanctuaries / National Parks and areas covered under Project Tiger and or

(c) Mining is being done without permission of the competent authority.

(iii) Cutting of trees.

(iv) Construction of any clusters of dwelling units, farm houses, sheds, community centres, information centres and any other activity connected with such construction (including roads, a part of any infrastructure relating thereto);

(v) Electrification (laying of new transmission lines).

- Any person, who desires to undertake any of the above-mentioned processes or operations in the said areas, should submit an application to the Secretary, MoEF, New Delhi in the prescribed application form. He / she shall also furnish an Environment Impact Statement and an Environmental Management Plan along with the application and such other information as may be required by the Central Government for considering the application.
- Areas where carrying on of processes and operations without permission is prohibited:

  I. All reserved forests, protected forests or any other area shown as "forest in the land records maintained by the State Government on the date of this notification in relation to Gurgaon District of Haryana and the Alwar district of Rajasthan.

  II. All areas like *Gair Mumkin Pahar, Gair Mumkin Rada, Gair Mumkin Behed, Banjad Beed* and *Rundh* in the lands records maintained by the State Government as on the date of this notification in relation to Gurgaon district of Haryana and Alwar district of Rajasthan. (*See Annexure IX)*

As per the notification under the Environment (Protection) Act, 1986, inviting objections against restricting certain activities in the specified area of Aravalli Range, which is causing environment degradation in the region. People say that it is not being implemented properly as found that several mining operations are being carried out in *Jamuwa Ramgarh Sanctuary, Sariska Tiger Reserve* and in regions which cover some part of *Arvari* basin. The copies of the petition filed in

the Supreme Court by the residents of *Mallana* village and other noted environmentalists along with the letter written to various concerned Ministries and departments regarding the illegal mining going on in the *Jamuwa Ramgarh Sanctuary and Sariska Tiger Reserve* are enclosed in *Annexure X*).

6.1.2. Research Studies

A study of the legal implications of community-based conservation mentions that forest and wildlife related laws in the state of Rajasthan have very few statuary provisions that facilitate community participation. The Central constitutional amendments on *panchayats* (1993) could have facilitated direct involvement of local people in the management and preservation of natural resources but the *Rajasthan Panchayat Act* which followed, does not appear to give much power to village institutions regarding local natural resources (Upadhyay, 1999).

Box 6.

Legal Hurdles and opportunities

Upadhyay (1999) studied the legal hurdles and opportunities for CBC in Rajasthan, with reference to *Bhaonta-Koylala* initiative as a reference point. He assessed a majority of the laws and policies that govern the forest and wildlife in the state of Rajasthan, including central ones like the *Wild Life (Protection) Act 1972, the Indian Forest Act 1927, the Forest Conservation Act 1980, the Panchayat (Extension to scheduled Areas) Act 1996, the Forest Policy 1988, the national Wildlife Action Plan 1983, the National Conservation Strategy, circulars and notifications regarding Joint Forest Management (JFM), Social Forestry and Ecodevelopment;* and state ones like the *Alwar Game Law 1913 and 1933, the Forest regulation 1921 and 1935, the Forest Grazing Rules 1921, the Rules for Regulation of Shooting in Alwar State 1941, the Rajasthan Forest Act 1953, the Wild Life (Protection) Rajasthan Rules 1977, the Ecodevelopment order of Rajasthan 1997, and the Rajasthan Panchayati Raj Act 1994.* This preliminary assessment showed, that though there are certain provisions and some recent initiatives towards involvement of local communities in forest and wildlife management, there is very little in terms of statuary provisions that actually facilitate community participation. The *Panchayat Act* is one case in point, which now provides direct involvement of local participation in management and preservation of natural resources, though the *Rajasthan Panchayat Act*, which followed, does not appear to give much power to village institutions regarding local natural resources.

Legal possibilities for the future include:

(i) Providing legal back-up to the *Government Order* regarding *JFM*; one way to do this would be to declare such *forests under Section 28 of the Indian Forest Act as Village Forests,* which would give local communities some degree of management control;

(ii) Utilising provisions of previous legislation (e.g. the *Alwar Game Act* 1913 & 1933), which does not contradict the *Wild Life (Protection) Act*, 1977, which could facilitate participation (e.g. through allowing grazing);

(iii) Utilising such provisions to generate new models of forest conservation and use, e.g. through the regulated harvest of non-timber forest produce from "*closed areas*";

(iv) Studying the possibilities of using customary laws, especially under the options available in the *Panchayat* legislation.

These possibilities need to be explored by agencies supporting the initiatives in *Bhaonta-Koylala.*

(Source: Shresth and Devidas, 2001)

6.1.3. Government Programmes and Schemes

Aravalli's Afforestation Project launched by Forest Department Rajasthan in the year 1992-93 with the financial assistance from OECF (Overseas Economic Cooperation Fund) Japan. Under this programme, afforestation works have been done in the area. The project was taken up with the objectives of conserving soil and moisture, checking desertification and for conservation of biodiversity of flora and fauna. It also aimed at creating employment for the locals – especially the tribals, women and the members of the Scheduled Castes and to fulfil the local demand for fuel and fodder. During implementation of this project, the forest department attempted the "people first approach" in the spirit of the National Forest Policy. This has brought significant results because at some villages like *Chounsala-Padak Chhapali*, village communities were involved from micro planning to the management of the forests resources.

The sanction of the project assistance for the second phase has been awaited since 1998. The funds for the second phase would have been released much earlier but for the Pokaran II nuclear tests in May 1998, which prompted the Japanese Government to slap economic sanctions on India. The Japanese think that the two years' period has proved the sustainability of the programme. Their delegation (October 1999 in *Udaipur*) acknowledged the fact that the project especially the VFPMCs (Village Forest Protection and Management Committees), helped reduce the antagonism of the people towards the Government forestry schemes. "The JFM has made villagers the stakeholders. This is a big change, a

sound transformation" observed by one of the Japanese delegates (Sebastian 2000). Forest department officials supported initiatives taken by community people of *Padak-Chhapali* and *Chounsala* villages for regenerating forests on the forest land in the region. This has built up good rapport between the community people and officials of forest department.



18. Regenerated forests by joint efforts of communities of *Chounsala* and *Padak-Chhapla* and forest department

6.2. Social and Community Initiatives for Forest Conservation

6.2.1. Sacred Groves and Orans:

As people living in arid and semi-arid areas, communities of the area were traditionally well aware of the importance of trees, forests and biodiversity and had a well established and efficient forest management and conservation system appropriate for their region. The indigenous systems of management of forests in this area were evolved long before colonial times. Some practices, traditionally adopted in Alwar region are *Kakad bani, Rakhat Bani, Dev Bani* (sacred grove) and *Oran* and *Rundh* or *Balbani* (see details in Chapter 5).

Box 7.

Orans are common lands, dedicated to a local deity or temple. These areas have traditionally been under the ownership of the temple and managed by members of the local community, who resorted to regulate use. All sorts of commercial exploitation were strictly prohibited in the Oran and the community members observed discipline in its conservation. In the post independence era, their ownership passed on to the state revenue departments, as a result, the community lost interest in its maintenance. Today, both the state and community are indisposed towards its regeneration and upkeep. Consequently, these sacred lands are over exploited and have reduced to open access resources with everyone using it without any concern for its management (Seva Mandir, 2001).

Culture and religion played a major role in developing, managing and protecting natural biodiversity and common resources. In the past there was a system of associating certain species of trees and animals with people belonging to different castes and clans (gotras). People of that particular caste / clan did not damage trees of these species e.g. felling / cutting / burning of *Neem* (*Azadirachta indica*) is prohibited for *Rajputs* belonging to *Rathore* clan. This practice is locally called *Dharadi Pratha* and has been described in *Chapter 5*. Villagers feel that the younger generations, unfortunately is not aware of such traditions. This should be revived for conservation of local biodiversity.

6.2.2. *Gram Sabhas (Lok Samitis)*

The community people of *Bhaonta-Koylala, Hamirpur, Samara and Padak – Chhapali* villages mobilised and facilitated by the NGO - *Tarun Bharat Sangh* formed a functional body as *gram sabha (Lok Samiti)* with the agenda of village forest and water resource management. The *gram sabha* is used as a platform for addressing common concerns through collective action. It has an open membership, with a quorum of 22 adults who by and large represent each hamlet in the two villages. The President (*adhyaksha*) of the *gram sabha* is responsible for conducting monthly meetings. It has formulated the following regulations and rules for forest and wildlife conservation:

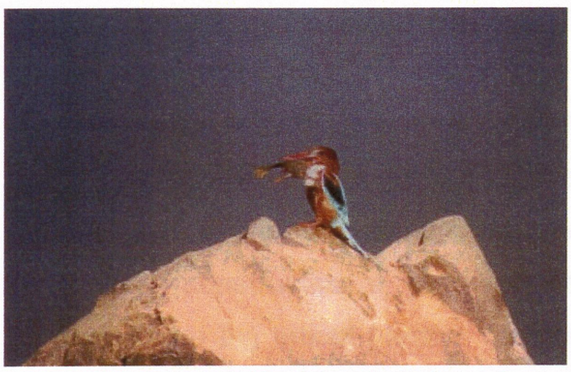
- No shepherd will go into the forest with an axe.
- If a shepherd is caught cutting a tree, he/she will be fined Rs. 11/-. Any person who, having witnessed such an activity fails to report it to the *gram sabha* shall be fined Rs. 21/-.
- No man or woman shall use an axe for collection of fuel. They will only collect dry wood.
- If wood is required for building a house or for a wedding, the person will collect it only with the permission of the *gram sabha*.
- The *gram sabha* will meet every month on *amavasya* (new moon day).
- In the meetings, any issue relevant to the village community will be discussed.

The *gram sabha* has the right to make changes in the regulations and enforce penalties. The body however, is not recognised by the State Government and has no legal backing since a formal body *gram panchayat* exists, although it is not functional. *Gram Sabha*, as a village self-institution ensures greater

people's mobilisation and participation for implementation of any community based initiatives. Final decisions are taken unanimously in the *gram sabha* meetings. This strengthens the stakes of the people, which has the greater ownership feeling among them. This ensures sustainability of the over-all development of the village. The existing *panchayat* bodies do not own this procedure and practice, which ultimately leads to the conflicting situations.

The *gram sabha* has established a village fund in which each household contributes five kg grain after the harvest for sustaining the resource development activities. The *Gram Sabha of Bhaonta-Koylala* could succeed to revive its forest and water resources and now all dried well have been recharged and wildlife in the village forest has been surviving well for last ten years.

Declaration of *Bhairon Dev Lok Van Abhayaranya*: After 10 years of successful forest protection effort by local communities of *Bhaonta-Koylala*, the forest was regenerated and wildlife revived it was declared a *Bhairon Dev Lok Van Abhayaranya* (people's sanctuary) in October 1998. The declaration of the sanctuary represents an ideological alternative to the state dominated conservation policy followed by the Forest Department. This is a unique example of a local community's successful effort at conservation of biodiversity.

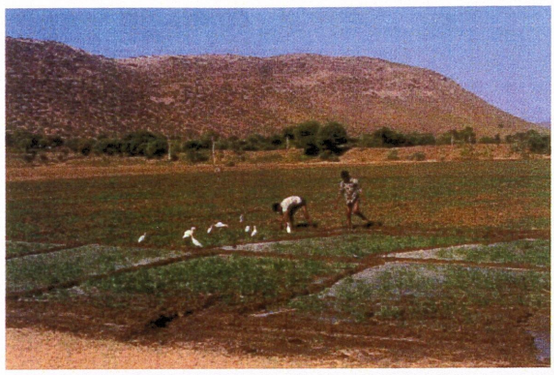


19. A White Breasted Kingfisher devouring a *Rana cyanoflictus* (India Skipper frog) atop an outcop bordering the *Bhaonta - Koylala anicut*

With the regeneration of forest, villagers report that a couple of leopards have started frequenting the forest. They have been lifting goats from the forest. As yet owever, there did not seem to be any ill feeling among villagers. The shepherds keep a sharp vigil while grazing their sheep. The villagers claim that the disappearance of tigers and other predators from the forest was the reason behind the depletion of forests. They mention that the presence of predators will inhibit people from going into the forest unless absolutely necessary and aid the conservation process.

Resource Availability and Livelihood Opportunities: According to the villagers the most visible change in the village is the presence of water as indicated by the recharged wells and greenery in the village. The villagers say that after 1990, there has been a rise in agriculture productivity and two crops can be easily taken

in a year. The livestock has become more productive due to the increased availability and security of fodder. Out-migration has also decreased with an increase in agricultural and pastoral production.

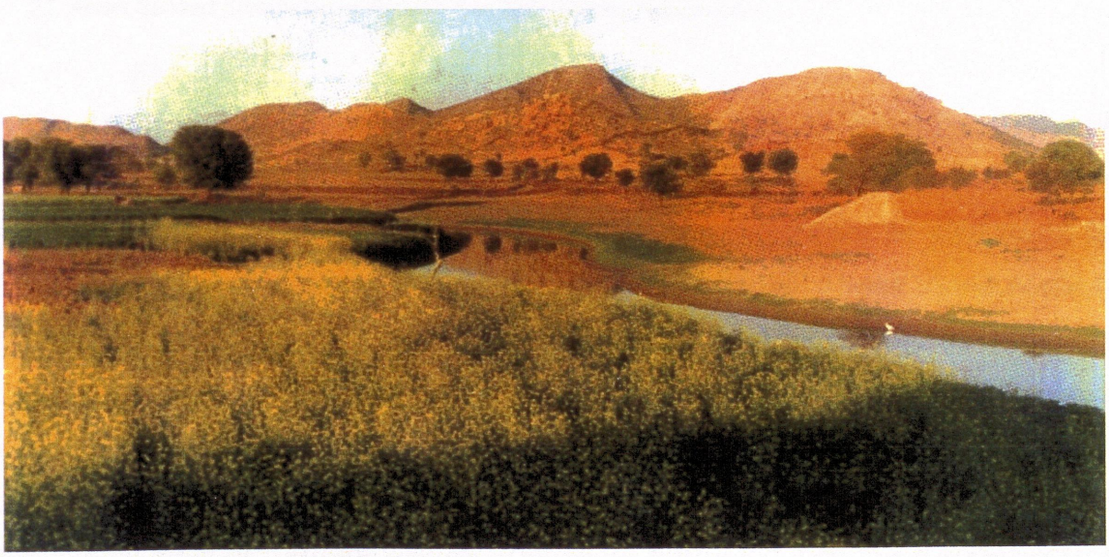


20. Cattle Egrets rendering their services to control insects in *Rabi crops*



21. Cultivation of Neem trees along with wheat crop.

Hamirpur, a small village in *Thanagazi* tehsil of *Alwar* district suffered huge scarcity of water, which created desert like situation. Agriculture production went down and migration was at peak. Village women drudgery increased since most of their time was spent in fetching water from distantly (2-3 km) located source of water. The village cattle used to be shifted to other areas for drinking water. These factors led to economic deprivation of the people. With the support of TBS, village community constructed a series of earthen rainwater harvesting structures (*Johad*) and a big anicut named ***"Jabbarsagar"*** which aimed at socio-economic regeneration of the village community. *Jabbarsagar* anicut is a repository of biodiversity of fish and several bird species. The president of India arrived in



22. *Arvari* brings prosperity in the area.

Hamirpur village to see the community initiatives on March 28, 2000. The President of India *Mr. K R Narayanan* in recognition of these efforts facilitated the *Gram Sabha* of *Bhaonta – Koylala* village with the 'Down to Earth, *Joseph C. John* Award' on March 28, 2000.

6.2.3. *Arvari Sansad* (People's Parliament)

The villagers of *Arvari* Watershed organised themselves and formed a people's parliament called *Arvari* Sansad in 1998 and formulated its rules and regulations for management of natural resources. Representatives of the 72 villages located



23. *Arvari Sansad Sammelan* at *Bhairon Dev Vanya Jeev Abhayaran*

in the *Arvari* watershed became members of the Sansad for managing the water resource and other natural resources of the area by adopting collective decision-making mechanism. Elected members (see *Annexure V)* from 34 villages of the 72 villages situated in the catchment attended the meeting. These representatives took a decision to form a 90-member parliament that would lay down guidelines concerning *jal, jungle* and *jamin* (water, forest and land). Issues like mining, forest felling, hunting and over-utilization of groundwater were discussed. A 15-member coordinating committee was formed headed by *Kanhaiya Lal Gujjar* (of *Bhaonta*) and *Chajju Ram* of *Samara* village. They were entrusted with the responsibility of

preparing a guideline for resource utilisation in the catchment based on suggestion arising out of the discussions. These guidelines have been ratified by the parliament. A committee has been formed to identify those forest officials that are known for their sincerity so that the *Sansad* could enter into collaboration with the FD. According to the members, though there is a strong will among the villagers, forest guards could be of help in enforcing regulations. It is hoped that through a process of dialogue with the FD, a collaborative network for conservation can be built up. TBS is initially acting as the facilitator but hopes to withdraw once the Sansad has established a working office and is fully functional.

At a Sansad meeting held on 5-6 June 1999 at *Samara* village, the guiding resolutions for the utilisation of natural resources were finalised. Some of them are listed below:

Direct Irrigation from *Arvari* River

- *No one is allowed to draw water directly from the river for irrigation, after Holi, as the lean season starts then. However, water may be drawn directly for livestock even after Holi.*
- *Before Holi, in the areas that are directly irrigated by the waters of Arvari, only mustard and gram may be grown. During the kharif rains, however, apart from sugarcane and rice, any crop may be grown.*

Irrigation from Wells

- *Only crops that require less water should be grown in the areas that are irrigated from the wells near the river.*
- *Vegetables are to be grown only according to local needs.*
- *People should be penalised for growing sugarcane and rice against the advice of the Sansad.*
- *The use of organic fertilizers to avoid soil degradation, damage to lands and to help retain moisture should be attempted.*

Market Independent Crops Grown (*Bazar mukt fasal*)

- *Production should be for local needs.*
- *Direct relations between the producers and the buyers should be established.*

Sale of Water banned

- *Water should not be drawn from the river using pumps.*
- *The waters of Arvari should not be used for commercial purposes or for mining operations.*
- *Digging bore wells to draw water should not be allowed in the Arvari catchment.*

Save wildlife and Fish

- *Villagers should keep watch over people who hunt.*
- *Areas that are affected by hunting are to be identified.*
- *A tiger protection programme should be identified, as the presence of tigers would act as a deterrent to hunting.*

Identify the Areas Affected by Mining

- *Put an end to all mining activities in the area.*
- *Lands that have suffered due to mining should be regenerated.*

Ban the sale of Land

- *Sale of land to outsiders should be prevented.*

Increase Greenery in the Catchment Area

- *There should be total ban on the cutting of green trees.*
- *Grazing of livestock from outside areas in the Arvari catchment should be prevented.*
- *Cutting of grass etc. should begin only after Deepawali, after the pastures have had a chance to regenerate during the monsoons.*
- *Pastures for livestock should be developed in the villages.*
- *Denuded hill slopes should be afforested.*

Prevent Overuse of water in *Arvari*

- *Since it is possible that the abundance of water might tempt the villagers and the government to overuse water, care should be taken to check such use and continue construction of Water harvesting structures to make the conservation effort sustainable.*

Encourage traditional methods of conservation

- *Revive traditional conservation methods.*
- *These methods should be written down by the educated youth of the region.*

Role of *Arvari* Sansad

- *Rules of the Sansad should be arrived at and enforced with consensus and discipline.*
- *The Sansad has been established for guiding natural resource use in the Arvari catchment.*
- *The Sansad should work for self-sufficiency of the village, community and for the disciplined use of the resources in the Arvari region.*

6.3. TBS Initiatives

The birth of TBS took place in 1975 when *K.V. Drone* and *Dr. S D Mishra*, teachers at *Jaipur* got together a group of like-minded colleagues who wanted to operationalise the *Gandhian* philosophy. Among them was a young activist *Rajendra Singh*, who was stirred by the movement launched by *Vinoba Bhave*, a *Gandhian*. TBS first became active in rehabilitating a group of poor labourers whose *santhies* were gutted in fire. From there, their work spread to rehabilitating pavement dwellers. They held meetings and discussions. In the end however, there was a feeling of emptiness, a kind of dissonance between what was said and what was done.

Then at one of the meetings, they decided to take a plunge and moved *en masse*, as a group of five volunteers, led by Rajendra Singh, moved towards unknown destination and came to *Thanagazi* in *Alwar* district in 1985. One of the worst drought in history was ravaging the area, already one of the poorest in *Rajasthan*. They set up a base in *Bheekampura* and started educating the young and providing basic medical services to the villagers in *Gopalpura*. Then one day, *Rajendra Singh*, the man who had come to educate the masses learnt the most valuable lessons of his own life. The teacher was *Mangu Kaka*, an old man of the village. He advised *Singh* to revive traditional water harvesting systems if he really wanted to help the people of *Gopalpura*.

Thus inspired, the youth began digging a derelict and silted pond nearby. They dug and shovelled mud for months. When the rains arrived, the pond was partially filled with water and the village was convinced that they were on the right path. The work continued for three long years. The results were beyond everyone's wildest estimates. Not only was the pond brimming, providing sufficient water to the residents of *Gopalpura*, the wells several kilometres downstream were recharged and full of water. Nothing succeeds like success. Other villagers were eager to replicate *Gopalpura's* example. With help from the residents of *Gopalpura*, water harvesting began in 45 villages of the region. Their achievements in turn inspired other villages. Thus began a chain reaction powered by a coming home of sorts to traditional wisdom, rural technology and cooperation among villages.

Beginning with *Gopalpura* village in 1985, TBS has played a leadership and catalysing role in the building of more than 5000 *Johad* (water harvesting structures) with the help of the village community in 1058 villages. This area covers parts of contiguous districts of *Alwar*, *Dausa, Bharatpur, Sawai Madhopur, Karauli* and *Jaipur* districts. Besides this, some *Johad* have also been built in the district of *Jaisalmer, Ajmer, Udaipur* and *Bharatpur*. Several works related to Natural Resource Management have been taken up i.e. building of *Johad* (the earthen dam), anicuts, small check dams for conserving each single drop of rainwater in the drought prone area of *Rajasthan*, which is still facing serious drought for last four years. Till date, TBS has already made more than 5,000 *Johad*, anicuts and check dams and regenerated 6,500 sq km of the land. Before the water conservation work, the places like *Thanagazi tehsil* in *Alwar* which were recorded as "Dark Zone" in the government records in 1985, which means nobody is allowed to further exploit the groundwater, has been transformed into "White Zone". All these efforts have helped in rejuvenating five monsoon rivers, namely *Arvari, Ruparel, Sarsa, Bhagani-Teldeh* and *Jahajwali Nadi* and made them perennial source of water. Now, after the work in all these villages, even after severe drought condition existing for last four years, water is there and the people are doing irrigation from the increased water table in the wells.

And now, to replicate the work done in *Alwar*, it has also started working in the western part of *Rajasthan* in the districts namely *Jodhpur, Pali, Nagaur, Jalore* and *Barmer.*

Community Development: The members of more than 1000 *Gram Sabha* i.e. the village institutions, *Mahila Sangathans* i.e. Women Groups and *Yuvak Mandals* i.e. Youth Groups mobilised by TBS individually and collectively discuss, decide and implement decisions collectively taken by them. The community develop and impose self-discipline for the common good of the village practicing true democracy in the management of water, forest and natural resources. They are engaged in water, forest and land conservation.

Economic Development: Construction of water harvesting structures increases and improves irrigation and crop practices leading to increase in the incomes for the household. It has also led to optimum utilisation of land and increase in livestock as well as their output of milk. This has provided a sustainable means of livelihood to more than 1000 villages of *Alwar, Sawai Madhopur, Karauli, Jaipur, Sikar, Bikaner, Tonk and Dausa* districts of *Rajasthan.*

Women's Empowerment / Formation of Self-Help Groups: Under the 'Women's Empowerment for Sustainable Natural Resource Management' undertaken by TBS, 293 women's groups have been formed of 19,250 women to take up 'Rain Water Harvesting Work, forest conservation, education and access to basic services. In this programme, women have participated in the construction of 182 water-harvesting structures. *Tarunshalas* set up by TBS have an enrolment of 1465 children of which 70% are girls. Women's groups have also formed their Women Banks and Cooperatives.

Medicinal & Health Interventions: TBS has, over the years, built up substantial knowledge of medicinal plants and have at its headquarters an Ayurvedic doctor. A first-aid ayurvedic medical kit has been distributed to women's groups to treat ailments at a local level. TBS has also organised 75 camps to disseminate this information further. TBS has a cadre of functionaries known as *Tarun Swasthya Rakshak.*

Activist Movement: *Gram Sabha* led to social cohesion and collective action, which created a community, aware of its rights and willing to fight for them. With the community, TBS started a *Jungle Sanraksha Yagya* (Forest Conservation Movement) in 1991 against marble mining covering 200 sq km of forests land threatening the tiger, wildlife and forest dwellers in the *Sariska Sanctuary.* A non-

violent *satyagrah march* was conducted to save the *Aravalli* in 1993; eventually mining was closed by a Supreme Court Order.

Forest & Wildlife Conservation Efforts: TBS has launched various movements such as 'Grow tree save tree campaign', 'Save water build johad campaign' and 'Ganga-gangotri campaign' for creating awareness towards saving wildlife, forest and rivers. With the cooperation of the State Education Department, TBS has launched a joint campaign to involve school children of 56 schools in conservation and protection of forest and wildlife.

Anti-mining and Anti-poaching Campaigns: TBS has launched people's anti-mining and anti-poaching campaigns in *Sariska Tiger Reserve*. It had a long fight against mining since 1987, mobilised people for a non-violent Satyagrah for closing mining in March 1993, and conducted a long *Foot March* to save *Aravalli* in October 1993. Eastern parts of *Sariska* were highly affected by poaching since October 1999. TBS launched people's campaign against poachers and established dialogue with people involved in the poaching activities. It designated 10 *Nahar Sewaks* to save the tigers and prepared *Sariska conservation groups* of school children and built up their capacity to save tigers and wildlife. It also organised camps in collaboration with forest deptts. and fixed strategy norms to stop poaching. Now, with the active support of TBS, a joint *Task Force* of forest department and local community has been formulated for protecting tigers and wildlife.

Launching of Campaign of School Children for Wildlife Conservation: TBS considers children as future generation to sustain present developmental activities. With the cooperation of State Education Department, a joint campaign was launched to involve children in conservation, protection activity and developed symbiotic relationship with forest and wildlife. Awareness and educating camps were organised for children of 56 schools (26 middle level, 18 Secondary and 12 Higher Secondary level) at *Sariska Tiger Reserve* area and established 52 *Tarunshalas* (Education centres) for out of school children engaged in child labour mainly for the age group 8 – 15 years. TBS also sensitised school children to grow and protect trees on agricultural lands, village lands and around their own houses.

CHAPTER 7

GAP ANALYSIS

7.1. Gaps in Information

India has a land based economy, so the importance of biodiversity becomes much more crucial for the country's sustainable development. The policy makers and those who are engaged in decision making at various levels have not understood the value of conservation of biodiversity not only for better future generation but also for the present scenario. The basic problems such as poverty alleviation can be tackled through conservation of biodiversity and also to achieve sustainable development of bio-resources for better common future of the people. Today we focus more on development actions like construction of roads, providing of electricity, irrigation facilities and tend to neglect the natural biodiversity conservation such as management of water, forests, pastures, wildlife etc. All this has been due to inappropriate development priorities, strategies and lack of futuristic vision among the policy and decision makers, which creates a huge gap relating to natural resources extraction and consumption in comparison with conservation and regeneration of biodiversity.

7.1.1. Wild Biodiversity

Although *Arvari* catchment and surrounding areas is rich in wildlife, biodiversity but has not yet been surveyed and explored completely.

- Several rare endangered and endemic species like Guggal (*Commiphora wightii*) occur in the regenerated forests of *Bhaonta-Koylala* and *Chounsala-Padak Chhapali* through community Based Conservation (CBC) but proper information about such endemic and threatened species is not known.

- There are several sacred groves and Orans managed traditionally by local communities but biodiversity conservers, policy makers, planners, community based organisations (CBOs) and NGOs lack systematic information about the present status of these biodiversity rich areas.

- New exotic / alien aquatic species of both plants and animals are coming in revived and newly constructed water streams and reservoirs however; systematic information about these species is not known.

- Large quantities of chemical fertilizers and pesticides / insecticides are being used in modern farming. In *Sainthal* Sagar catchment, vegetables are extensively cultivated and huge quantities of chemicals and pesticides are used. The run off from the agricultural fields and reaches the water bodies. Although, harmful effects of these chemicals are well known but systematic studies of the effects of these on the aquatic flora and fauna are not available.

- Indigenous knowledge about the medicinal plants, both wild and cultivated ones, and their conservation measures has not been systematically recorded. It could be a renewal and potential resource (e.g. *Ardusa - Adhatoda zeylanica* which grows in denuded foothills) for income generating activities for local communities especially deprived sections and women of the society. The local communities have not understood the market value of such wild plant species.

- Local communities are not aware about the *Forest and Wildlife (Protection) Acts* and various *notifications* of the government issued from time to time and renewed.

7.1.2. Domesticated Biodiversity

- Most farmers do not use composting technique for preparing indigenous manure from cattle dung and crop residues because of lack of proper scientific knowledge. They spread untreated cattle dung and crop residues directly on agricultural land, which has less effect as manure.

- Some new hybrid varieties of crops like gram and mustard become too susceptible to frost during winters and most farmers lack knowledge about saving the crops from heavy loss. The traditional knowledge of the people was used effectively for protecting their traditional crops from the frost but it is not much effective for the new hybrid varieties.

- Information about the indigenous races of different crops still being grown in the area by marginal farmers has not been systematically assessed.

- The construction of rain water harvesting structures *Johad* / anicuts / small check dams at various sites of catchments of *Arvari* rivulet has resulted in increase of water table in the area and the wells which had been dried for many years have now charged once again bringing prosperity to the entire region. It has enhanced the agricultural productions and harbours a rich biodiversity with the increase in the number of birds and animals visiting the area but no systematic studies are available on this aspect and lack of adequate and reliable data and information on *Arvari* watershed.

- Information about crop weeds, their impact on crop plants and socio-economic importance has not been studied.

7.2. Gaps in Vision

- Conservation attempts must have the full and equal participation of local communities from the stage of conceptualisation to planning and implementation but this vision is very weak in the government functioning mechanism.

- The local community has a fundamental right to resources necessary for living and livelihood along with a responsibility to conserve these resources in protected areas and other natural habitats without external interferences. This vision in ground reality is not practiced by both community and government functionaries.

- Introduction of exotic species *Vilayati Babool* (*Prosopis chilensis*) at a large scale eroded local biodiversity and grasslands in the hilly tracts. The forest department has not visualized its economic, social and cultural impact in the region. It needs to be systematically assessed.

- Community aspirations for its livelihood aspects are not given due weightage while visioning the development programmes by the government functionaries.

- The importance of pasturelands in the rural economy primarily based on agriculture and animal husbandry has not properly visualized by the State

Government. These areas considered as tree less blanks were either released for agriculture or were planted with exotic species *Vilayati Babool* by forest department or leased for mining activities, consequently, the prime pasturelands of the region were destroyed.

7.3. Gaps in Policy and Legal Structure

- **Environmental Notification:** In view of the environmental degradation that was taking place in the Northern Aravallis, the Ministry of Environment and Forests, GOI issued a notification in May '92 (*See Annexure IX*) restricting certain activities in certain specified areas. As per provisions of this notification, the environmental clearance for these activities was to be given by the MOEF. The GOI, on November 4, 1999 delegated the power to allow the activities to the State Government of Rajasthan. A direction was given to the State government to prepare a 'Master Plan' for integrating the environmental concerns keeping in view the future land use of the area within two years. In addition, two committees, were formed (1) State level Expert committee for giving the environmental clearance of the proposal and (2) Monitoring committee with the district collector as its chairperson. This committee is to see that the conditions stipulated at the time of clearance are followed. The state government has not so far prepared the desired 'Master Plan'. The main purpose of the notification has been partly diluted because the state government is more susceptible to local pressures of mining, construction and industrial lobbies.

- Under the *Forest and Wildlife (Conservation) Act*, the forest department personnel feel that they are now the owners of the forest resources and the sole responsibility of the forest lies with them. They many a times treat local community badly causing physical harassment and charge hefty bribes. This indifferent attitude of forest department forces the community members to consider that forest is no more their property, because it alienates them from natural resources and they start to try and snatch as much as they can. This creates grim conflicting situations.

- Upadhyay (1999) carried out a study of legal implications of community-based conservation and noted that forests and wildlife laws in the State of Rajasthan have very few statuary provisions that facilitate community

participation (*Bhaonta –Koylala* as a specific example). The central constitutional amendment on *padyatras* could provide direct involvement of local participation in management and preservation of natural resources, but the *Rajasthan Panchayat Act,* which followed the central legislation, does not give much power to village institutions regarding local natural resources.

- Rich traditional system for biodiversity conservation in village community is not taken care of while formulating policies and laws related to biodiversity conservation.

- In community regulated / managed areas as is in the case of *Bhaonta – Koylala* and *Chaonsla Padak – Chhapali*, there is no provision in the *Wildlife Protection Act 1972* to notify community-controlled areas as sanctuaries without communities losing their traditional rights over the resources.

- Women, besides managing their domestic chores like cooking, cleaning, spinning and grinding have to work as gatherers of fuel wood for cooking and fodder to feed the livestock. In some cases of extreme poverty, these head loads are the main source of their income. Women are therefore important stakeholders in forests. Welfare of women, therefore directly depends upon the quality and availability of forest resources. They, generally have more knowledge and awareness about different trees, fodder plants and agricultural biodiversity. Yet, they are marginalized at the time of decision-making and benefit sharing. At times, women are not even permitted to sit with men in the public meetings, although they have been given due representation in *Panchayat Raj*. Therefore, we organised several separate meetings with village women during the field study. There is a provision for constitution of separate women sub-committee for the VFPMCs. The forester of the area is supposed to organise meetings and interact with its members. He is also supposed to report their views to the general body and executive body of the VFPMC. However, in *Arvari* region it has been observed that no such committees have been formed so far. Proper interaction with the village women is difficult because the forest

department does not have women employees at the frontline level that can meaningfully interact with the village women.

- In the *Arvari* region, only the extremely poor men and women earn their daily income by selling head loads of fuel wood and fodder. At present no poverty alleviation programme focussed for their development is being implemented in the area.

- The *Wildlife Protection Act* does not provide for management of wild animal (e.g. Nilgai) populations. It provides in general for elemination of animal causing damage to property or life. There should be a check on the numbers of animals out side the forest areas. In the absence of any natural predator and availability of ideal habitats in the form of agriculture fields, the animal population has already reached menacing stage. The farmers are desperate about this mega-pest and are organising agitations against the policy of the government.

7.4. Gaps in Institutional and Human Capacity

- The farmers lack scientific knowledge about the appropriate use of chemical fertilizers and pesticides / insecticides in crops. For imparting this knowledge to the local community, there is no systematic planning available with the concerned departments of agriculture and horticulture. There is also lack of institutional support to promote organic farming among village farmers.

- Lacking information and knowledge about some of the troublesome weeds like *Gajar ghas* (*Parthenium hysterophorous*) which was introduced into the country along with consignments of *PL-480* Wheat and now it is spreading rapidly in the area, even in forestlands. This has been suppressing local flora and has become alternate host to various microbial pests of local crops.

- Bodies constituted by community people like *Arvari Sansad*, Lok Samiti, Women's Groups, Forest and Wildlife Task Force and VFMCs have traditional knowledge about biodiversity but they have not been imparted legal and technical knowledge on the subject in simple and communicating language.

- The local forest officials and staff seem dissatisfied with the structure of the Forest Department (FD). According to them, the FD in Rajasthan seemed to be growing without any coherence or direction as numerous posts are being created to ensure promotion. There is dissatisfaction with the status of training as well (*Shresth and Devidas, 2001*).

Box 8.

Problems faced by Forest Department

The Forest department officials say that only two officers are selected annually to attend the training programme in FRI (Forest Research Institute) and WII (Wildlife Institute of India), Dehradun. This figure seems woefully inadequate for entire state of Rajasthan. According to the staff, the state govt. does not have funds to send any more personnel for training. There are several training institutes in the state. Alwar has one, but they are understaffed. Most of the faculty is on deputation and are juggled around frequently. Resource crunch does not allow the FD to arrange adequate infrastructure for its ground level staff. Some forest guards do not even have transport to carry out their duties. Many staff members get implicated in legal battles in the course of their duties. There is no legal or financial support mechanism for such cases.

(Source: Shresth and Devidas 2001)

CHAPTER 8

MAJOR STRATEGIES TO FILL THE GAPS AND ENHANCE / ATRENGTHEN ONGOING MEASURES

Addressing the socio-economic conditions of the people is the only way to create personal stakes in the maintenance and sustainable use of the biodiversity. It has been considered that the strategies would have to be based on a system of decentralized governance in conjunctions with CBOs, NGOs and State departments. For the decentralization model, the role of the CBOs / NGOs would become important in handling the biodiversity issues, running marketing cooperatives, addressing distributional equity with other agencies chipping in through provisions of necessary technical know-how skills for fund management, conflict resolution etc. The functioning mechanism of the involved agencies in the decentralized model would be participatory, transparent and accountable to the local communities.

The lessons drawn from the people's experiences help in designing some specific principles based on which action plan is being strategized. These designing principles are as follows:

- As the TBS experience show that all strategies should be designed in such a manner that all initiatives should revolve around water resource (like construction of water harvesting structures and their management on sustainable basis) because all life forms survive in and around the water resources and socio-economic aspect of the people is directly impacted by this;
- Empowerment of the people to the extent that they start treating the common resources as their common property and take care of it;
- Local communities have rights to resources necessary for their livelihood, along with a responsibility to conserve bio-resources, without interferences from market forces (*Source: Recommendations proposed in national workshop for conservation of wildlife and forests held at Sariska Tiger Reserve, September 2000*);

- Inculcating and nurturing the belief among forest department officials, policy makers and environmental experts that only people can protect, conserve and regenerate the richness of the bio resources;
- Involving people rather than imposing prohibitive policies is the key to regeneration and management of bio-resources;
- Animals and plants have a *fundamental right to existence*. The *Wildlife (Protection) Act* is essential to protect this right and it is being accepted that the primary right of conservation values in protected must be recognised;
- Conservation attempts must have a *full* and *equal* participation of local communities from the stage of conceptualisation to planning and implementation;
- Efforts at conservation, social justice and sustainable development have to hand in hand along with brakes on the consumerism of the rich bio-resources;
- The complete protection of *threatened biotic* (both faunal and floral) elements and some *areas as inviolate* (e.g. groves) with the consent and participation of local communities is essential;
- Prioritising regeneration of natural bio-resources and plantation of indigenous species rather than exotic species.

Strategies:

Based on the above principles and filling gaps mentioned in Chapter 7, the following strategies are proposed by TBS to various stake holders including government departments like *Panchayat*, Irrigation and Forests.

- The broad strategy proposed is to organise, strengthen community groups such as *Arvari Sansad, Gram Sabhas and PRIs* and build their capacities to identify and address sustainable resource management including water, forest and land resources. An intensive exercise of perspective building will be taken jointly by forest department and local NGO with the community groups to create awareness of the concept of equitable and sustainable resource management.

- The specific strategy of holistic watershed perspective is followed to assure accessibility of water to the entire community and conservation of biodiversity of the area. In the process, equitable and uniform geographic distribution of water would be essential for assuring accountability of the community to revival of the bio-resources. However, sustainable strategies for linking up the village institutions with *panchayats*, district administration, state government development schemes will also be ensured.

- Women's empowerment would ensure an enabling environment for building women's groups to address the issues of biodiversity conservation. Women could be supported, by local NGOs, forest department and decision makers in building and enhancing traditional knowledge of bio-resources and they will also be supported to participate in the entire planning and resource management process in the *Lok Samitis* (each village will have its own *gram sabha*). There would be a proper representation of Women in all committees, which manage bio-resources and opinions of the women would be recorded separately in all the decision making bodies. It is very essential because the gender biased attitude prevails prominently in the village community which prohibits involvement of rural women in dealing with the biodiversity issues, although they are most concerned with these issues in their daily life for fodder, fuel needs etc.

- Identification and capacity building of social mobilizers at clusters and village level would facilitate the learning process of community groups for biodiversity issues. In this process, NGO (*Tarun Bharat Sangh*) can play a role of a catalyst. In the process of capacity building, the members of *Lok Samitis*, *gram panchayat,* government functionaries, other NGO workers will also be oriented to the people centres concept of watershed development, biodiversity and NRM through exposure and exchange visits.

- The village fund (*Gram* Kosh) of the *Lok Samitis* and Women's Groups would be linked with larger development funds such as Government development schemes and other financial institutions for making the village self-reliant.

- The networking and coordinating strategy between different stakeholders and concerned departments such as forest, irrigation, watershed, animal

husbandry, health, education, mining and district administration should be established for continuous consultation / better coordination and technical support to have greater impact on the issues of watershed development, biodiversity (forest and wildlife) conservation and livestock development. It will help the implementers in integrating intersectoral issues.

- **Pasture Development:** Conservation efforts would be exercised in human impacted systems where biodiversity faces a real threat, like development and rehabitation of the degraded lands – forests, pastures which fulfil the needs of the various sections of the community and still hold potential to maintain diversity upon their survival. The lessons could be taken from the success story of regenerating forests and bio-sources in *Bhaonta – Koylala* villages.

- **Planning of Biodiversity Conservation to be Based on People's Aspirations and Needs:** There is a need to understand the linkage between development needs and biodiversity conservation and to address the priorities of people as regards personal and social advancement through enhancing their livelihood security, provision of basic infrastructure etc.

- **Flexibility in Development Planning:** The development planning would be kept flexible for conservation species, sites or strategies prioritised by local people that would receive matching priority at official level.

- **Making Conservation a Mass Movement:** The local people would be made to realize the worth of biodiversity present in their environs. This would entail documentation of the wealth of knowledge and skills available amongst people about wild and cultivated biodiversity. The strategy should also envisage rewarding and felicitating communities or individuals engaged in conservation or who have special knowledge about biodiversity. This would contribute greatly to motivating young and old people to keep alive the sharing and transfer of information amongst each other and initiate conservation efforts if the need arises.

- *Building the capacity* of village community people, women groups for collective actions and concerned govt. officials for developing a joint sustainable biodiversity management system through training programmes,

exposure visits etc. These will be organised by NGO / *Arvari Sansad* in collaboration with concerned govt. departments.

- A systematic documentation of wealth of indigenous knowledge and skills available amongst people about natural and domesticated biodiversity will be done by forest department, research organisations / local NGO working on this issue. The strategy would be designed to envisage rewarding and felicitating communities or individuals engaged in conservation or who have special knowledge about biodiversity.

CHAPTER 9

ACTIONS REQUIRED TO FILL GAPS AND ENHANCE / STRENGTHEN ONGOING MEASURES

Based on gap analysis and proposed strategies, the actions to be undertaken for implementation of BSAP in the *Arvari* catchment are as follows:

9.1. ***Actions for promoting community initiatives*** *through capacity / strength building of the people's groups or individuals for a sustainable natural resource management (including revival of water and bio-resources).*

9.1.1. Action: Empowering *Arvari Sansad* (People's Parliament) for handling issues of biodiversity, water resources, land utilization and social justice.

Category: High priority, to be carried out within 5 years.

Activities:

- Organising regular, periodic meetings of the *Sansad* (one day in each quarter) on building perspective about biodiversity (linkage between plants, animals and human beings) in the community and counterparts in the forest department to increase cooperation.
- Strengthening *Arvari Sansad* as an autonomous body with more self-financial reliance for taking decisions regarding area development and biodiversity conservation for coordination and monitoring of the activities.
- Organising workshops (2-3 days) for the members of Sansad for imparting technical knowledge for development of resources, their utilization and developing an understanding of legal and government regulatory framework (Three workshops in each year).
- Setting up *Sansad's* networking with government departments (mainly field functionaries of forest and wildlife, agriculture, irrigation, health and education), NGOs, research institutions and funding agencies.
- Mobilising resources (from community, government and other funding agencies) for creation of fund for *Arvari Sansad* in order to sustain its activities.

- Providing continuous research and training support to the Sansad.
- Enhancing women's participation for which extra efforts would be made (like organising separate meetings or workshops for women).
- Organising exposure visits for the members of *Arvari Sansad* in other parts of the State and Country.

Responsibility: The *Panchayat Raj. department* would make appropriate amendments to empower people's bodies such as *Arvari Sansad* to effectively control and manage the natural resources.

Time-duration: Five years.

Resources required: Rs. 20 lacs.

9.1.2. Action: Formation of Women's Groups and *Lok Samitis* and building their capacity for village resource mapping, micro planning and development of project proposals.

Category: High priority, to be completed within seven years.

Activities:

- Organising open discussions for rapport building in the village to have better understanding among the villages for dealing with issues related to biodiversity;
- Formation of women's groups in 10-15 villages where these groups do not already exist;
- Formation of *Lok Samitis* (one in each village) based on the experience of *Bhaonta – Koylala* and ensuring representation of women and deprived sections of the village community;
- Organising workshops for capacity building of these groups for village resource mapping, micro-planning and preparations of project proposals and developing an understanding about village resource management, their equitable sharing on sustainable basis, legal and regulatory framework of the government, right to information and biodiversity and gender issues, setting linkages with government departments;

- Documenting and mapping biodiversity by members of *Lok Samitis* and women's groups and productivity of the bio-resources in their area.
    - Creating job opportunities especially for women and deprived sections by building their capacities for self-employment. For this purpose, linkages with financial organisations such as NABARD and other such institutions will be established;
    - Organising exposure visits to the successful community initiatives for sustainable NRM in other areas;
    - Establishing village fund in each village in order to sustain the development activities through resource mobilisation of village community and government schemes;
    - Providing technical and professional support for formulating development activities such as watershed development, reviewing ongoing programmes, conflict resolutions and raising external financial resources;

Responsibility: *Lok Samitis* and *Women's Group* in each village with active support of *Gram Panchayat* and *TBS.*

Time – duration: Five years.

Resources require: Rs. Ten lacs for a period of five years.

9.1.3. Action: Development of Joint Forest Management Approach in about 20 revenue villages where common forestland exists.

Category: High priority, to be completed within 10 years.

Activities:

- Organising discussion meetings between officials of the forest department and villagers, members of *gram panchayat* and Women's groups and assessing the status of the village forest resources and people's needs;
- Organising foot-marches (*Padyatras*) for consensus building on need for constituting a Joint – Forest Management Committee (JFMC) for the

management of forest resources in the protected areas (Pas) by members of Forest department, *Arvari Sansad, Lok Samitis* ,Women's groups. TBS to exchange information on biodiversity in agriculture, animal husbandry, forest for awareness building and its effects on conservation, employment, income etc;

- Formation of JFMC keeping proportionate representation of all sections of the village society (including women), forest officials and representatives of *gram panchayat*, other government departments and NGO. The JFMC should be headed by a villager chosen by the entire village and the decision making or executing body of the JFMC having equal representation of women and disprivileged classes / castes of the village;
- Preparing work plan for undertaking forest management activities and designing strategy for regeneration of existing plant species, promoting new plantation and revival of wildlife and water resources (including construction of rainwater harvesting structures), soil conservation and resource need identification;
- Setting up community - based norms and principles for forest management;
- Capacity building of members of JFMC for above activities through workshops and exposure visits to successful community or joint community – forest department initiatives;
- Evolving a participatory process for continuous reviewing of the activities and status of the forest resources. For this external professional assistance will be provided to JFMC;
- Mobilising financial resources primarily from government department and village community;
- Conducting impact study in the fifth year.

Responsibility: *Forest department* in collaboration with *Arvari Sansad* and TBS support.

Time-duration: 10 years.

Resources required: Rs. Two crores.

9.1.4. Action: Formation of *Joint Management Committees* for existing large water resources (mainly Sainthal Sagar) which is rich in biodiversity and people's livelihood largely depends on these resources.

Category: High priority, to be completed within 5 years.

Activities:

- Formation of Sainthal Sagar Management Committee, keeping proportionate representation of government departments (e.g. Irrigation, Fishery, Forest and Wildlife and Watershed development etc.), local communities and NGO and ensuring 50 percent participation of women representatives of different sections of the society and disprivileged class for bio-resource management;

- Organising public hearings on existing government norms set for the management of the *Sainthal Sagar* water reservoir and addressing people's livelihood, biodiversity conservation and social justice. For example the cess being collected by the revenue department on cultivation of vegetables in "*Peta*" (tank bed) should be utilized for the development of the *Sainthal Sagar*.

- *Creation of a Fund for Ensuring Sustainable Development of Bio-resources of the Area*: In order to create the people's stake, the issue of economic incentives need to be addressed. People have expressed the willingness to regulate the trade of biodiversity resources at the local level through collection of cess from the traders, setting up of marketing cooperatives etc. (e.g. Cess collected from *Sainthal Sagar* goes to the government). The cess collected would be ploughed back for the improvement of the bio-resources of the area. Responsibility of this should be of the village *panchayat*.

- Organising workshop with the committee members for perspective planning for maintenance and further development of the water reservoir and deciding norms / rules for use of water and utilization of revenue collected from it;

- Organising awareness people's campaign against outside hunters of migratory birds in the area.

Responsibility: *Gram Panchayats*, *Arvari Sansad* with back up support of TBS, Forest and Wildlife, irrigation, revenue departments and district administration.

Time-duration: Five years.

Resources required: Rs. 20 lacs to be managed from cess being collected from the Water reservoir by the State government.

9.1.5. Action: Revival of traditional culture and practices for conservation of biodiversity (plants and animals) in Sacred groves, sacred waters and forest areas.

Category: Medium priority, to be completed within 7 – 10 years.

Activities:

- Organising cultural activities using folklore to integrate biodiversity conservation as part of people's life;
- Mobilising community people and forest department for promoting to grow indigenous plant species;
- Organising people's campaign against encroachment by people in sacred groves and forests for hunting, cutting of green trees and agriculture;
- Setting up norms for sustainable use of these resources by inhabitants.

Responsibility: *Lok Samitis* (*Gram Sabhas*) to be supported by *Arvari Sansad,* Environment and Forest, science and technology departments and TBS.

Time-duration: 7 – 10 years.

Resources required: Rs. 7 lacs to be mobilised by TBS from government schemes, funding agencies and community contribution through *Arvari Sansad.*

9.1.6. Action: Capacity building of biodiversity conservers and traditional health practitioners.

Category: High priority, to be undertaken for 5 years.

Activities:

- Organising discussion meetings with biodiversity conservers such as cattle grazers, traditional seed conservers, farmers, vaidyas, women and documenting their traditional wisdom of conservation.
- Undertaking of traditional seed conservation activity for agriculture and horticulture by farmers and women's groups to improve the agricultural biodiversity.

Responsibility: Forest and Agriculture departments in collaboration with *Arvari Sansad* and *Lok Samities*.

Time-duration: Five years.

Resources required: Rs. 5 lacs to be managed by Forest and Agriculture departments.

9.1.7. Action: Formation of a Task Force of Forest department and *Gram Sabhas* or *Lok Samities* for community based forest management.

Category: High Priority to be completed within one year

Activities:

- Constituting a *Task Force* for protected areas (PAs) and areas need to be protected for stopping of green tree felling and initiating and strengthening activities for wildlife conservation;
- Organising *padyatras* for consensus building on need for constituting a Joint Task Force for the management of forest resources in the protected areas by members of Forest department, *Arvari Sansad, Lok Samities*, Women's groups, TBS to exchange information on biodiversity in agriculture, animal husbandry, forest for awareness building and its effects on conservation, employment and income etc.

Responsibility: Forest department in collaboration with *Arvari* Sansad.

Time-duration: Five years.

Resources required: To be managed by forest department.

9.2. ***Actions for undertaking assessment studies / reviews / evaluation*** *on various aspects of biodiversity and impact of various development activities on livelihood of the people and ecology of the area.*

9.2.1 Action: Inventorization of Wild floral elements (including algae, lickens, mosses, liverworts, flowering plants).

Category: High priority, to be completed in two years.

Activities:

- Preparation of vegetation grid map of the area by conducting participatory rural appraisal technique, at least for important and rare plant species to develop a baseline survey, which can be used for comparative studies in future. Since the area is of smaller size, hence interval of vertical and horizontal grids should be 3 – 5 kms;
- Assessing status of plants belonging to different groups and habitats through systematic survey of the area by experts with community involvement;
- Identification of threatened plant species, casual factors which are responsible for their status and role of these plants in the ecosystem, their utility aspects and preservation measures;
- Identification of potential plant material for creating sustainable livelihood opportunities for the people by taking benifits of the available traditional knowledge of the local people;
- Periodic monitoring of regeneration propensities of the area by using the modern techniques such as remote sensing and GIS (Global Information System).

Responsibility: Botany department of University of Rajasthan / Botanical Survey of India, Arid Zone circle, *Jodhpur;* CULP, *Jaipur* in collaboration with forest department and TBS.

Time-duration: Two years.

Resources required: Rs. ten lacs financial assistance to be provided by State Department of Science and Technology (DST).

9.2.2 Action: Inventorization of Wild fauna of the area (including forest and aquatic fauna).

Category: High priority, to be completed in two years.

Activities:

- Assessment of status of animal species and their role in the ecosystem by experts with active involvement of local community by using their indigenous knowledge.
- Identification of threatened species, casual factors and their utility aspects and conservation measures.

Responsibility: Zoology department of Rajasthan University or Zoological Survey of India, *CULP*, *Jaipur* in collaboration with Forest and Wildlife department and TBS.

Time-duration: Two years.

Resources required: Rs. ten lacs to be provided by State Government and Central government.

9.2.3. Action: Stopping marble mining in *Kalsi-Kala* village and action to rehabilitate the areas demaged by mining activities.

Category: High priority, immediate, to be completed in one year.

Activities:

- Organising public hearings on people's rights;
- Assessing socio-economic and invironmental impacts of quarrying activities;
- Identification of control measures for restoration of biodiversity of the area;
- Discussing legal and regulatory framework for any future mining activities in the region.

Responsibility: *Panchayat Raj* department and other associated departments of the government.

Resources required: Rs. Two crores be provided by State Government for the study and cost of rehabilitation is to be estimated which depends on the village community.

9.2.4. Action: Impact study of marble mining activities in *Jhiri* area.

Category: High priority, immediate, to be completed in one year.

Activities:

- Conducting detailed field survey
- Analysis of the field data
- Recommending action plan to the government for development activities in the area.

Responsibility: Research organisations like *Pravaran Prahari / IDS / CULP* in collaboration with *TBS*, Forest department and *Arvari Sansad*.

Resources required: Rs. 1.5 lacs be provided by the State Government.

9.2.5. Action: Undertaking socio-economic impact study of the ongoing activities and status of aquatic flora and fauna (including migratory birds) in Sainthal Sagar water reservoir and role of government department and community participation in management. No further exotics to be introduced until a detailed impact is understood through studies.

Category: Medium priority, to be completed within 5 years.

Activities:

- Organising public hearings involving people from all sections of the society;
- Assessment of economic activities and revenue collected from these by government department;
- Assessment of present status of the reservoir (including its physical condition, biotic components) and role of government and communities in its management;
- Suggesting future strategy for its management.

Responsibility: Autonomous research organisation (e.g. IDS, and CULP, Jaipur) with Fisheries, Irrigation and Revenue departments.

Time-duration: Two years.

Resources required: Rs. 2.5 lacs be provided by concerned departments of State government.

9.2.6. Action: Study / review of successful community initiatives (e.g. *Chounsala, Padak-Chappali* and *Samara*) for revival of water and forest resources (2-3 case studies) along the lines of *Bhaonta – Koylala* study by *Kalpavriksh* (*Shresth and Devidas 2001*).

Category: Medium priority, to be completed within 5 years.

Activities:

- Process documentation of the initiatives;
- Identification of the limitations and constraints of the initiatives;
- Lessons to be drawn for furtherance of the initiatives in larger area.

Responsibility: *Arvari Sansad* with professional assistance from TBS.

Time-duration: Five year.

Resources required: Rs. One lakh for each case study be provided by State government.

9.2.7. Action: Review of existing Government policies and regulatory framework regarding water, land utilization, forest and wildlife, mining, environment and human settlement in the light of ground realities and people's welfare.

Category: Medium Priority to be completed in 2-5 years.

Activities:

- Organising discussion meetings with different stake holders for inviting their perceptions about the policies and rules and understanding people's aspirations;

- Analysis of the policies and regulatory framework with regard to ground realities of the area;
- Suggesting alternative framework of the policies and modification / additions to the relevant laws for meeting the people's aspirations.

Responsibility: An *autonomous Research Organisation (e.g. IDS / Prayavaran Prehari, Jaipur)*, which could be identified by Forest department in consultation with *Tarun Bharat Sangh*.

Time-duration: Two years.

Resource Required: Ministry of Forest and Environment.

9.2.8. Action: Providing formal legal authority to the well organised people's groups like *Lok Samitis* (*Gram Sabha*) of *Bhaonta-Koylala* and *Arvari Sansad* (People's Parliament) whose initiatives have brought significant success for eco-restoration of the region.

Activity: Completing relevant formalities required for achieving legal status for *Bhanota-Koylala* forest management.

Responsibility: Forest department and *panchayat Raj* department in consultation with *Arvari Sansad / TBS*.

Time-duration: Within one year.

Resources required: Nil.

9.3. ***Actions for formulation and implementation of development schemes*** *for addressing people's livelihood and biodiversity conservation issues.*

9.3.1. Action: Construction of water harvesting structures (including anicuts / farm bunds) and mobilising community people for its sustainable management (in 30-40 villages).

Category: High priority, to be undertaken immediately providing relief from the drought conditions.

Activities:

- Conducting PRA through discussion meetings with village groups (i.e. *Lok Samiti*, *Gram Panchayat*, Women's groups) for identifying water needs of the people;
- Preparing project proposal for renovation of old water resource(s) / construction of new water harvesting structure(s);
- Designing strategy and norms for maintenance of the resource(s) and proper utilization on sustainable basis;
- Mobilising financial resources from ongoing government schemes through *gram panchayat* or *Arvari Sansad*;
- Ensuring women's participation in the entire decision-making process and management. To achieve this, a separate women sub-committee can be formulated which will convey their decisions / recommendations to the general body of JFMC.

Responsibility: Lok Samiti to be supported by *Gram Panchayat*, *Arvari Sansad*, Watershed development and soil conservation departments.

Time-duration: Five years.

Resources required: Rs. 50000/- per water structure; 25% community contribution and remaining from Watershed Development and soil conservation departments.

9.3.2. Action: Pasture development on village common or forestlands.

Category: High priority, to be covered within 5 – 10 years.

Activities:

- Holding awareness / knowledge building camps for cattle grazers on the fodder requirement for their livestock, to develop understanding for making grazing and developing fodder plantations and pastures and improving breeds through indigenous bulls etc.

- Planning meeting with community people (i.e. *Lok Samitis* and Women's groups, *Gram Panchayat*) for assessing their fodder requirement and potential plant species available locally for promotion in pasturelands;
- Deciding coordination strategy between different stake holders for the development of village pastureland and its management;
- Raising plantation on degraded forest land, community land and pasture land.

Responsibility: *Gram panchayats, women's groups* with the support of Forest and Animal Husbandry departments.

Time - duration: Five years.

Resources required: Rs. Two crores with 10 – 15% community contribution and remaining be provided by Animal Husbandry and forest department.

9.3.3. Action: Implementation of afforestation programme on degraded common lands and farm forestry. Village JFM committees will undertake this.

Category: Medium priority, to be undertaken for 5 – 10 years.

Activities:

- Selection of environmentally suited technology and plant species for afforestation and farm forestry which could meet people's need on sustainable basis;
- Orienting members of *Lok Samiti* and women's group for taking responsibility of implementation and monitoring the scheme in their own village.

Responsibility: *Lok Samiti / Women group* be supported by Forest, Watershed development and Soil conservation departments.

Time-duration: Five years.

Resources required: 10 - 20% community contribution and the remaining from government development schemes.

9.3.4. Action: Cultivation of medicinal plants such as *Ardusa* (*Adhatoda zeylanica*), *Asavgandh* (*Withania somnifera*), *Satavar*, *Guggal*, *Kala Jiri* (*Vernonia*

antihelmintica) to uplift the economic and health status of the people and conservation of some of the rare species of medicinal importance.

Category: Medium priority, to be undertaken in 5 years.

Activities:

- Raising home backyard herbal gardens by village women;
- Assessment of the potential medicinal plant resources (*Ardusa* at experimental level) in natural habitats;
- Establishing linkages of community people with the local traders and assessing needs for local consumption patterns;
- Designing and implementation of procedural norms including biological monitoring for material exploitation from nature and its supply to the consumer without having a negative affect on environment;
- Organising skill training of women for raising nurseries and cultivation of medicinal plants and preparation of herbal medicines at local level;
- Building capacity of the cultivators and introducing appropriate technologies for processing of the raw material before providing to pharmaceutical companies / industries and exploring marketing of the material.

Responsibility: Women's groups and *Lok Samiti* with the support of Health department (mainly Ayurvedic), Forest department and TBS.

Time-duration: Five years.

Resources required: Rs. Ten lacs.

9.3.5. Action: Eradication of *Vilayati Babool* (*Prosopis chilensis*) from the area in phases and using its wood for making charcoal as a source of alternate income generation by economically weaker sections of the village community and its replacement by indigenous species.

Category: Medium priority, 10 – 15 years.

Activities:

- Providing appropriate technological assistance for uprooting the plant and making charcoal;

- Making norms for marketing charcoal for income generation and ecological restoration;
- Carrying out replacement of uprooted plants by indigenous species chosen by villagers to maximise the biodiversity and livelihood gains.

Responsibility: *Lok Samitis* and women's groups supported by Forest department.

Time-duration: 10 - 15 years.

Resources required: Rs. 5 lacs.

9.3.6. Action: Orienting farmers in wormi composting technique for preparation of manure for promoting organic farming.

Category: Medium priority, 5 – 10 years.

Activities:

- Orienting farmers, cattle grazers and women for using composting Technology / technique for preparation of organic manure from cattle dung, household waste and crop residue;
- Providing earthworms at low cost with the support of *Krishi Vigyan Kendras* and Agriculture Universities in collaboration with NGOs.

Responsibility: *Arvari Sansad* and *Lok Samiti*.

Time-duration: Five years.

Resources required: Rs. 10 lacs.

9.3.7. Action: Adoption of Traditional Seed Conservation needs to revive the knowledge in the region and to learn from others experience such as *Deccan Development Society* in *Andhra Pradesh*. Changes are also needed in the public distribution system to enable the traditional seed conservation technique for promoting indigenous crops.

Category: Medium priority, 5 years.

Activities

- Orientation of farmers and women in appropriate seed conservation / seed storage techniques.
- Identification of local traditional deeds that are still being maintained by some farmer for their personal uses.
- Popularising the benefits of uses of seeds in the entire community.
- Providing monitory benefits to the people in the initial stages for propagation of such seeds by bye-back, etc.

Responsibility: Agriculture department and knowledgeable NGOs.

Time-duration: Five years.

Resources required: Rs. 2 lacs.

9.3.8. Action: Appropriate use of improved technology in agriculture, horticulture, animal husbandry and other livelihood activities, which should be relevant for biodiversity conservation and improving the economic status of the people.

Category: Medium priority, to be completed within 5 years.

Activities:

- Orienting personnel of Agriculture department in acquiring or developing suitable technologies in partnership with communities and then disseminating them.
- Organising skill training for cultivators and animal rearing people;
- Conducting demonstration activities on agriculture fields.

Responsibility: Agriculture and Horticulture departments.

Time-duration: Five years.

Resources required: Rs. 5 lacs to be managed by Agriculture and Horticulture departments.

9.4. *Actions for integrating biodiversity components of conservation in school curriculum.*

9.4.1. Action: Orienting schoolteachers for the implementation of the BSAP proposed for the area through school activities.

Category: Medium priority, to be completed within 7 – 10 years.

Activities:

- Organising 2-3 day workshops with schoolteachers for developing understanding of integration of biodiversity issues in the curriculum.
- Organising exposure trips / eco-tracking / nature study camps for students, teachers and curriculum planners to make them eco-friendly and imparting experience how to deal with issue of integration of biodiversity in the curriculum;
- Developing coordinating strategy with state education department and organisations / persons already working on this issue such as CEE, local NGOs for effective implementation of the actions;
- Reviewing existing curriculum of the State.

Responsibility: State Education Department in collaboration with department of environment & forests.

Resources required: Rs. 50,000 for a course of 5 days for 100 teachers.

9.4.2. Action: Awareness campaigns by schoolteachers and students.

Category: Medium priority, to be completed in 10 years.

Activities:

- Celebration of the World Environment Day, World Forestry Day, World Earth day, Wildlife week, *Van Mahotsav*, Fire week etc. on regular basis in the school;
- Biodiversity melas, exhibitions, essay writing, discussions (debate), drawing competitions etc.;

- Promoting plantations in and around school premises;
- Nature study tours in the region;
- Exposure visits to areas of community based successful efforts for biodiversity conservation such as sacred groves, sacred waters, sacred hills, sacred river confluences etc.

Responsibility: NGOs (e.g. *TBS, CULP*) working for education of children with the technical support from agencies like Centre for Environment Education (CEE), departments of Education and Environment & Forests for actions 9.4.1. & 9.4.2.

Time-duration: Ten years for actions 9.4.1. & 9.4.2.

Resources required: Rs. 25 lacs be provided by State Departments of Forest and Environment and Education for actions 9.4.1. & 9.4.2.

CHAPTER 10

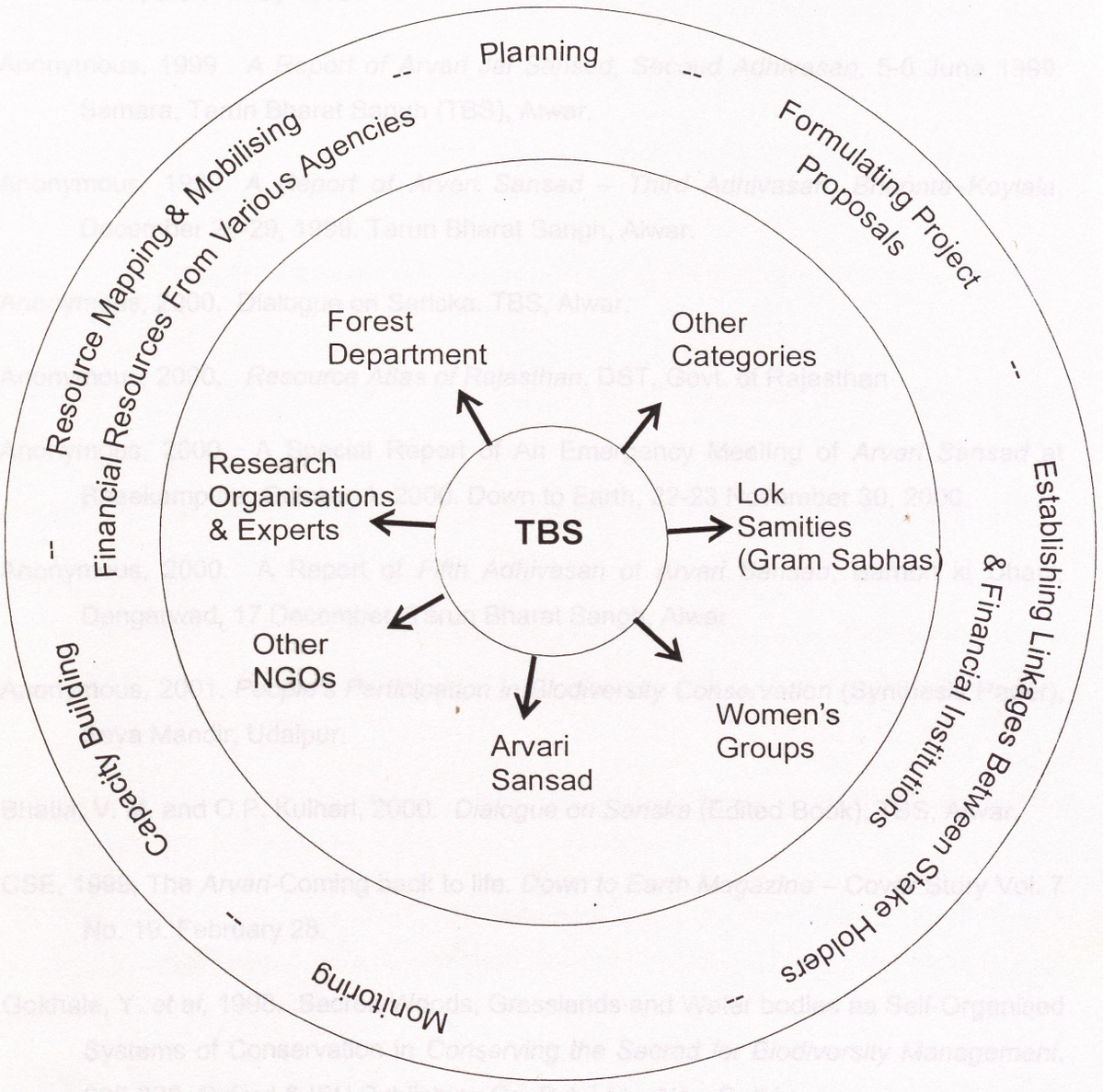
OPERATIONAL IMPLEMENTATION OF THE ACTION PLANS AND FOLLOW UP

The Strategies and Action Plans proposed in Chapter 8 and 9 are to be implemented through collaborative efforts of several organisations, mainly *Tarun Bharat Sangh, Arvari Sansad, Forest Department,* and other relevant government agencies, *Lok Samitis / Gram Sabhas* and Women's Groups. TBS will have core responsibility of capacity building of people's groups, mainly *Arvari Sansad, Lok Samitis* and Women's groups for village resource mapping, planning and formulating activity implementation schedules of each village and setting linkages between PRIs, Forest and Wildlife department and other government agencies. TBS will be responsible for overall coordination and monitoring of the BSAP activities in collaboration with village level groups through mobilisation of Government agencies, other grassroot NGOs and *Arvari Sansad.* At village level, the *Lok Samiti* will have the sole responsibility of planning, implementation and monitoring of the programme activities. Appropriate actions for evolving a process of monitoring and reviewing or evaluation of the BSAP implementation in participatory mode such as designing monitoring indicators, continuous review and planning of the activities for taking corrective measures in time conducting, evaluation of the project and documenting case studies of the successful initiatives will be undertaken in collaboration with professional groups by the BSAP implementing agency.

Regarding external resource mobilisation, TBS and Forest department will provide continuous support to the *Arvari Sansad* and *Lok Samitis*. Other agencies like Agriculture, Horticulture, Soil conservation, Watershed development, Education departments will implement their Action Plans (as mentioned in Chapter 9) in collaboration with *Arvari Sansad*, *Lok Samitis* and Women's groups. Women's groups will be strengthened for participating in every activity. Detailed implementation and monitoring schedules will be worked out in the beginning of the programme by concerned agency.

The Actions proposed in SAPs of Aravalli Eco-region, Rajasthan State will be consulted, and coordinating strategies will be decided for implementation of the activities to avoid overlapping.

Operational Implementation



CHAPTER 11

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Annexure I

Field Survey / Study Team

1. Shri Kanhaiya Lal	: TBS faculty convenor of the Arvari Sansad
2. Shri Virendra Sharma	: Teacher, Arvari Sansad member
3. Shri Chhote Lal Meena	: TBS Field Worker
4. Shri Rang Lal Meena	: TBS Field Worker
5. Ms. Bhagirthi Rathore	: TBS Field Worker
6. Shri Narendra Singh	: TBS Faculty
7. Dr. Satish K. Sharma	: Forest Official, Forest and Wildlife expert
8. Shri Rakesh Srivastava	: Lecturer (Botany) in Govt. College, Dausa. Expert in Sacred grove.
9. Dr. O.P Kulhari	: BSAP coordinator

Key Participants

- Members, *Arvari Sansad*.
- Community members of 13 villages.
- Members of *Gram Sabha* of *Bhaonta – Kolyala*.
- Members of Women's Self Help Groups.
- Officials of Forest Department (*Sh. Tejveer Singh*, Project Director, *Sariska*).
- TBS faculty and village level volunteers.
- Coordinator, *Aravalli* Eco-region *(Sh. V. D. Sharma)*.
- Representative of *Kalpvriksh (Ms. Kanchi Kohli)*.
- **Experts**:
  - *Dr. S. Mishra* (Retired Professor, Botany department).
  - *Prof. M. S. Rathore*, Agriculture Economist (IDS, Jaipur).
  - *Dr. Rakesh K. Srivastava*, Sacred Grove expert (Lecturer Govt. college, *Dausa*).
  - *Dr. Satish Kumar Sharma*, Ornitho-botanist (Range officer, Forest Department, Govt. of *Rajasthan*).
  - *Dr. O. P. Kulhari*, (Taxonomist), BSAP coordinator.
  - *Dr. Sudhir Upadhyay* (Social scientist and *CULP* member).
  - *Dr. Lalit Kishore* (Educationist and Chairperson *CULP*).
  - *Dr. (Ms.) Kanchan Mathur*, Gender expert (Director, Women Resource Centre, *RIPA*).

Annexure III

Local Advisory Committee (LAC) of Arvari Sub-state BSAP

1. *Shri Rajendra Singh* : General Secretary, *TBS, Alwar.*
2. *Shri V. D. Sharma* : Retired PCCF, Department of Forest and Wildlife, Govt. of Rajasthan. Presently, coordinator BSAP for *Aravalli* Eco-region.
3. *Shri Tejveer Singh* : Project Director, Sariska Tiger Reserve, Alwar. Department of Forest and Wildlife, Govt. of Rajasthan.
4. *Dr. O.P. Kulhari* : *Arvari* Sub-state BSAP Coordinator, TBS. (Presently in *Sandhan*), Jaipur.
5. *Shri Chhajuram* : Coordinator, *Arvari Sansad*, Vill. & Post – Samara, Tehsil – Thanagazi, Alwar.
6. *Shri Kanhaiya Lal Gurjar* : Deputy Coordinator *Arvari Sansad* (*Bhaonta-Kolyala*) and Senior Faculty member of *Tarun Bharat Sangh, Bheekampura-Kishori, Alwar.*
7. *Mrs. Manbhar* : *Bhaonta-Kolyala, Alwar.*
8. *Dr. (Mrs.) Archana Pareek* : *CULP*, C-151, Dayanand Marg, Tilak Nagar, Jaipur.
9. *Shri Chhote Lal Meena* : J. Ramgarh, Area Coordinator, *Tarun Bharat Sangh, Bheekampura-Kishori, Alwar.*
10. *Shri Suresh Chandra* : Member of Education Resource Team in Women's Empowerment for Sustainable Natural Resource Management Project, *Tarun Bharat Sangh, Bheekampura, Alwar.*
11. *Shri Virendra Singh* : Teacher, Govt. Upper Primary School, *Padak-Chhapali* (also member of *Arvari Sansad*), *Thanagazi, Alwar.*
12. *Shri Daulat Singh* : Ranger, Sariska Tiger Reserve, *Alwar*, Department of Forest and Wildlife, Govt. of Rajasthan, *Sariska, Alwar.*
13. *Shri Shambhu Dayal* : Vill.- Hamirpur, via – *Thanagazi, Alwar.*
14. *Dr. Rakesh Srivastava* : Ethnobotanist and expert on Sacred groves. Presently, Lecturer in Botany, Govt. College, *Dausa, Rajasthan.*
15. *Ms. Bhagirthi Rathore* : Member of Resource Team (Health and Education) in Women's Empowerment for Sustainable Resource Management, *TBS, Alwar.*

Annexure IV a

Description of Meetings Organised

S. No.	Date	Place of meeting	Participants	Issues discussed
1.	Oct. 1, 2000	TBS Hq. Bheekampura	TBS faculty members (5), Kalpavriksha representatives (2), Scientist working on biodiversity (1), School teacher (1).	Discussed the objectives of the NBSAP, project area, methodology, study sample, time bound Work Plan
2.	Oct. 1, 2000	TBS Hq. Bheekampura	Emergency meeting of Arvari Sansad.	Assessed the prevailing drought situation in the region and decided strategy for overcoming the crisis. (Report published in *Down to Earth* on 30 Nov. 2000.
3.	Oct. 2, 2000	TBS Hq. Bheekampura	TBS faculty, Arvari Sansad members.	Discussed BSAP objectives and role of Arvari Sansad members.
	Oct. 3, 2000	TBS Hq. Bheekampura	TBS field volunteers.	Planning meeting.
4.	Nov. 6, 2000	Jaipur	Aravalli ecoregion Coordinator, experts (3) and BSAP coordinator.	Identified field survey team and discussed survey strategy.
5.	Dec. 17, 2000	Baranon ki Dhani (J. Ramgarh)	Village community (15).	Biodiversity livelihood issues.
6.	Dec. 17, 2000	Baranon ki Dhani – 5th Arvari Sansad Meet	Members of Arvari Sansad, Para teachers, Field survey team and Researchers from IDS (Total 209 persons including 40% women.	Presented minutes of earlier Arvari Sansad meeting. Discussed issues related to village NRM; biodiversity problems were identified.
7.	Dec. 17, 2000	Kaled (J. Ramgarh)	Community people	Domesticated biodiversity and livelihood issues.
8.	Dec. 17, 2000	Sainthal Bundh Borunda (J. Ramgarh)	Community members, Farmers and Field survey team.	Management of water resource; biodiversity issues, relationships between Govt. authorities and Local communities.
9.	Dec. 18, 2000	Bhaonta-Kolyala	Members of Gram Sabha and Arvari Sansad.	Community initiatives for forest revival and water harvesting. Rules and regulations evolved by the community for sustainable NRM.

10.	Dec. 18, 2000	Padak-Chhapali	School teachers (5), farmers, gram sabha members (9) and field survey team (4). (5 Women members from Gram Sabha)	Conservation measures evolved by community for regenerating forest resources. *Dharadi Pratha* for conservation of tree species and animals.
11.	Dec. 19, 2000	Jaitpura	Community members (15), members of Arvari Sansad and Field team.	Domesticated biodiversity, Wildlife and development activities affecting biodiversity, role of women in NRM and community decisions.
12.	Dec. 19, 2000	Samara	Members of Arvari Sansad, members of gram panchayat & cattle grazers, farmers and field team.	Role of Arvari Sansad, gram panchayat and women groups in dealing with issues of biodiversity conservation and NRM, particularly water and forest.
13.	Dec. 19, 2000	Natala	Teachers, students, members of gram sabha, women and TBS workers.	Domesticated biodiversity and role of schoolteachers and students for creating awareness.
14.	Dec. 20, 2000	Kalsi Kala	Schoolteachers, mining labourers, cattle grazers, farmers, women and TBS workers.	Domesticated and natural biodiversity and threats caused by increasing mining activities.
15.	Dec. 20, 2000	Raghunath-Pura	Women, community members, teachers, cattle grazers and field survey team.	Biodiversity conservation in protected areas and sacred groves through individual and community efforts.
16.	Mar. 6, 2001	TBS Hq. Bheekampura	TBS faculty, field volunteers and female animators.	Experience sharing (feedback).
17.	Apr. 22, 2001	Nimri (Jaipur district)	LAC members and Kalpavriksha representatives.	Status of the BSAP draft.
18.	May 22, 2001	Bundh Borunda	Vegetable growers (both men and women), cattle grazers, fishermen, local community, members of Kalpavriksha, TBS workers and members of LAC.	Observed Wildlife in and around the Sainthal Sagar, impact of the water harvesting structures on the economic status of the local community and their role in resource management.

19.	May 23, 2001	Tarunshala Raghunath-Pura	Members of Arvari Sansad (both men and women), school teachers, students, cattle grazers, farmers, scientists, members of Kalpavriksha, Aravalli Ecoregion and forest department.	Role of the members of Arvari sansad, gram Sabhas, women Groups, Teachers and Students in managing village resources. Elicited perceptions of the people and documented (video film also prepared).
20.	May 23, 2001	Kalsi Kala	Members of LAC, scientists, Kalpavriksha, village community (both men and women) and schoolteachers.	Observed hazards being caused by a large scale mining activities in and around the village and documented people's perceptions in a video film.
21.	May 23, 2001	TBS Hq. Bheekampura	Members of LAC, invited scientists, Kalpavriksha, TBS field workers.	A formal meeting of LAC, Arvari sub-state BSAP status was discussed and shared experiences of the LAC members.
22.	25 July 2001	Raisar (Jamwa Ramgarh)	5th meet of the members of Arvari Sansad. About 300 people (both men and women) from 74 villages of Arvari catchment participated, agriculture scientists, watershed development experts (Dr. M S Rathore), gender expert, scientists and 32 visitors from Himachal Pradesh, TBS workers.	Presented the status of the Arvari BSAP draft and its broad findings shared experiences of the members of gram sabhas of different villages and invited suggestions from the participants for the BSAP draft preparation.

23.	Jun. 15-17, 2001	TBS Hq. Bheekampura	A woman sammelan about 3000 women participated out of which about 500 women were from Arvari region; other participants from other gender experts, women political leaders, media persons, NGO representatives and government. This sammelan was not organized as part of BSAP process. A linkage was drawn to seek inputs from 52 women present from Arvari area.	Discussed village resource management issues especially biodiversity and water and participation of women and their in decision-making process at community level. Identified women's issues and problems and tried to evolve the strategy for building the capacity of village women NRM, self-employment and biodiversity conservation.
24.	Feb. 5, 2002	TBS Hq. Bheekampura	LAC meeting, 9 members participated.	Discussed BSAP draft and shared comments receieved from Kalpavriksh.

Annexure IV b

Meetings Organised with Village Communities

Village	Participants	Date
Baranon ki Dhani (J. Ramgarh)	20	Dec. 17, 2000
Borunda (Sainthal Sagar) (J. Ramgarh)	35 2-3 meetings	Dec. 17, 2000 May and June 2001
Sainthal Sagar (Dausa)	15	May 22, 2001
Padak-Chhapali	21	Dec. 18, 2000
Bhaonta-Kolyala	26	Dec. 18, 2000
Jaitpur	11	Dec. 19, 2000
Natata	9	Dec. 19, 2000
Samara	35	Dec. 19, 2000
Kalsi-Kala (Jhiri)	66	Dec. 18, 2000
	50	May 23, 2000
Jagnathpura (Jhiri)	21	Dec. 18, 2000
	35	May 23, 2000
Dev ka Devra	11	Dec. 19, 2000
Kaled	16	Dec. 20, 2000
Palia Kheda	21	Dec. 20, 2000
Dumoli- Khatala	50 (3 meetings)	May & June 2001

Annexure V

Elected Members – Arvari Sansad

S.No.	Member	Village (Population)	Panchayat
	Panchayat Samiti – Thanagazi, District – Alwar		
1.	Sh. Roodaram Gurjar	Kankad ki Dhani (500)	Aagar
2.	Sh. Ram Kumar	Kankad ki Dhani	Aagar
3.	Smt. Manhar	Sunder ki Dhani, Bhanwta (400)	Aagar
4.	Sh. Bajrang Singh	Rajput ki Dhani, Bhanwta	Aagar
5.	Sh. Chhote Lal Gurjar	Rajput ki Dhani, Bhanwta	Aagar
6.	Sh. Gobinda Gurjar	Upla Guwada, Bhanwta	Aagar
7.	Smt. Mooli	Kolyala (300)	Aagar
8.	Sh. Arjun Gurjar	Kolyala	Aagar
9.	Sh. Chheeter Gurjar	Kolyala	Aagar
10.	Smt. Roopa Devi	Bhooriyawas (1000)	Aagar
11.	Sh. Bhartya Gurjar	Bharta ki Dhani	Aagar
12.	Sh. Hazari Lal meena	Radi ki Bani (300)	Aagar
13.	Sh. Kajod Gurjar	Chausla (500)	Padak
14.	Sh. Hari Prasad Meena	Chausla	Padak
15.	Sh. Hajoota Ram Meena	Padak (800)	Padak
16.	Sh. Badri Meena	Padak	Padak
17.	Sh. Raju Singh	Padak	Padak
18.	Sh. Mool Chand Meena	Padak	Padak
19.	Sh. Ram Lal Gurjar	Chhapali (600)	Padak
20.	Sh. Shravan Gurjar	Modala ki Bani (200)	Aagar
21.	Sh. Kana Ram Gurjar	Aagar (500)	Aagar
22.	Sh. Khanja Ram Gurjar	Toda (600)	Pratapgarh
23.	Sh. Ran Chand Meena	Lalpura (1200)	Lalpura
24.	Sh. Kalu Ram Meena	Lalpura	Lalpura
25.	Sh. Ramnath Meena	Chaha ka Baas (1000)	Lalpura
26.	Sh. Bhaura Ram Kumhar	Chaha ka Baas	Lalpura
27.	Sh. Godu Ram Gurjar	Palasna (1000)	Pratapgarh
28.	Sh. Badri Prasad Yogi	Palasna	Pratapgarh
29.	Sh. Bhairusahay	Lothabaas (600)	Pratapgarh
30.	Sh. Kalyan Sahay	Lothabaas	Pratapgarh
31.	Sh. Teja Ram Gurjar	Panchbaki (400)	Lalpura
32.	Sh. Nathu Ram Gurjar	Nangal (800)	Lalpura
33.	Sh. Arjun Gurjar	Nangal	Lalpura
34.	Sh. Omprakash Nirlep	Pratapgarh (4000)	Pratapgarh
35.	Sh. Kishan Lal Meena	Pratapgarh	Pratapgarh
36.	Sh. Ramdhan	Doomoli (500)	Doomoli
37.	Sh. Gopiram	Doomoli	Doomoli
38.	Sh. Kajod Meena	Doomoli	Doomoli

39.	Sh. Hari Singh	Kharata (300)	Doomoli
40.	Sh. Panna Lal	Kharata	Doomoli
41.	Sh. Prabhu Dayal	Khardata	Doomoli
42.	Sh. Ramprasad	Sawantsar (700)	Doomoli
43.	Sh. Prabhu Singh Meena	Chakiparoki (300)	Doomoli
44.	Sh. Gajraj Singh	Jagannathpura (200)	Doomoli
45.	Sh. Phool Chand Meena	Hamirpur (1000)	Doomoli
46.	Sh. Ramdhan Meena	Galawala (300)	Doomoli
47.	Sh. Bhagwan Sahay Sharma	Sharma ki Dhani (200)	Doomoli
48.	Sh. Nathuram Meena	Hamirpur	Doomoli
49.	Sh. Revadmal	Hamirpur	Doomoli
50.	Sh. Lallu Ram Meena	Khairuka ki Dhani (200)	Doomoli
51.	Sh. Bhola Ram	Gali ka Guwada	Doomoli
52.	Sh. Sugga Nath	Jogion ki Dhani (200)	Doomoli
53.	Sh. Bhaure Lal Meena	Jaisayaka (300)	Samra
54.	Sh. Shravan Lal Meena	Tingariya (200)	Samra
55.	Sh. Chhote Lal Meena	Guwada Ramdas (200)	Samra
56.	Sh. Girraj Prasad Sharma	Samra (800)	Samra
57.	Sh. Babulal Meena	Khajudiawala (200)	Samra
58.	Sh. Gokul Ram Meena	Kalyaka (300)	Samra
59.	Sh. Gokulchand Gurjar	Gyarsa (200)	Samra
60.	Sh. Kanchan Nath	Jogion ki Dhani (300)	Samra
61.	Sh. Moolchand Meena	Rajawali (200)	Samra
62.	Sh. Kishan Lal Meena	Neejra (250)	Samra
63.	Sh. Jagdish Gurjar	Devka Dewra (300)	Samra
64.	Sh. Kishan Lal Gurjar	Devka Dewra	Samra
65.	Sh. Shravan Gurjar	Nal ka Guwada (200)	Samra
66.	Sh. Chhaju Ram Gurjar	Sandaya (150)	Samra
67.	Sh. Ramkishan	Galawala (100)	Samra
68.	Sh. Kajod Meena	Benada ki Dhani, Kalaid (200)	Samra
69.	Sh. Sonaram	Benada ki Dhani, Kalaid	Samra
70.	Sh. Ramchandra Meena	Telyawala, Kalaid (200)	Samra
71.	Sh. Kalluram Thekedar	Jhakdya (250)	Samra
72.	Sh. Sitaram Meena	Chukawal Kalaid (300)	Samra
73.	Sh. Mangilal Meena	Khatiyawala Kalaid (250)	Samra
74.	Sh. Mewanath	Khatiyawala Kalaid	Samra
75.	Sh. Shishupal Meena	Kalaid (1100)	Samra
76.	Sh. Gobind Ram	Jaitpur Gujran (600)	Samra
77.	Sh. Ram Pratap	Jaitpur Gujran	Samra
78.	Sh. Chhajuram Meena	Natata (1000)	Samra
79.	Sh. Ramprasad Meena	Natata	Samra
80.	Sh. Dyabhan	Pratapgarh	Pratapgarh
81.	Sh. Raghunath Meena	Nareda (900)	Pratapgarh

82.	Sh. Kajod Meena	Nareda	Pratapgarh
83.	Sh. Jagdish Meena	Natata	Pratapgarh
Panchayat Samiti – Jamwa Ramgarh, District - Jaipur			
84.	Sh. Dhasi Ram	Darolai (1000)	Raisar
85.	Sh. Sedu Ram Gurjar	Darolai	Raisar
86.	Sh. Mohmmad Khan	Raisar (2000)	Raisar
87.	Sh. Tejaram Gurjar	Chainpura (1000)	Raisar
88.	Sh. Prabhat Kasana	Chainpura	Raisar
89.	Sh. Kishna Gurjar	Bahlod (2000)	Raisar
90.	Sh Bhaunre Lal Sarpanch	Bahlod	Raisar
91.	Sh. Nanag Ram Meena	Bassi (800)	Neemla
92.	Sh. Kaluram Meena	Bassi	Neemla
93.	Sh. Kalyan Sahay Meena	Rawanya (500)	Neemla
94.	Sh. Phool Chand Meena	Rawanya	Neemla
95.	Sh. Ramji Lal Meena	Ugota (700)	Neemla
96.	Sh. Ram Sahay Meena	Ugota	Neemla
97.	Sh. Dyaram Meena	Neemla (900)	Neemla
98.	Sh. Bhaurelal Meena	Neemla	Neemla
99.	Sh. Raj Narayan Meena	Shrinagar (700)	Neemla
100.	Sh. Jagdish Prasad Meena	Shrinagar	Neemla
101.	Sh. Ramji Lal Meena	Heengwala	Neemla
102.	Sh. Bodan Lal Meena	Ramyawala (300)	Neemla
103.	Sh. Sukhdev	Ramyawala	Neemla
104.	Sh. Kalyan Sahay Meena	Baad Sokhla (200)	Neemla

New Members Elected in the 2nd Adhivasan (16 February 1999) of Arvari Sansad at Paddak

S.No.	Member	Name (Population)	Panchayat
Panchayt Samiti – Thanagazi, District – Alwar			
1.	Sh. Ramlal Gurjar	Chhapali	Padak
2.	Sh. Boduram Yogi	Chhapali	Padak
3.	Sh. Jagdish	Bhadaj	Padak
4.	Sh. Prabhat Meena	Bhadaj	Padak
5.	Sh. Dulichandra	Aamka	Padak
6.	Sh. Sadhuram	Aamka	Padak
7.	Sh. Nanuda	Aamka	Padak
8.	Sh. Rampal Balai	Aamka	Padak
9.	Sh. Rampal Kumhar	Aamka	Padak
10.	Sh. Ram Singh	Narehet	Padak
11.	Sh. Sukhram Panch	Narehet	Padak
12.	Sh. Hari Kumhar	Narehet	Padak
13.	Sh. Ramsahay	Bhadara Kaawas	Padak

14.	Sh. Khyali Ram	Hardeva ki Dhani	Aagar
15.	Sh. Omprakash Jagid	Padak	Aagar
16.	Sh. Ramkishan	Padak	Aagar
17.	Sh. Hanuman Gurjar	Chhapali	Aagar
18.	Sh. Bhoma Balai	Bhadaj	Aagar
19.	Sh. Bhagwan Meena	Bhadaj	Aagar
20.	Sh. Chajju Ram Gurjar	Fakala ki Dhani	Aagar
21.	Sh. Kanaram Koli	Aagar	Aagar
22.	Sh. Kajod Meena	Doomoli	Aagar
23.	Sh. Ramdhan Meena	Kalalika	Aagar

Annexure VI

Rainwater harvesting structures, bundhs, anicuts constructed by communities with the support of Tarun Bharat Sangh (Patel, 1997)

1. Bavdiwala Johad	2. Sadhu Gurjar ka Bandh, Amka
3. Rampal-ka-Anicut	4. Rajonath-ka-Anicut, Narhat
5. Kankarwali Johadi, Kankar ka Guwara	6. Namkyawala Bandh, Dholi Danthi
7. Gopal Das ka Johad, Chandla ki Dhani	8.Kana Gurjar ka Bandh, Dabka
9. Janburiwali Johadi, Jatya ka Haar	10. Dhina Johad ka pas wali Johadi
11. Hardeva ka Johad, Hardeva ki Dhani	12. Dudika ki Dhani ka Johad
13.Bhagwana ka Johad, Dudika ki Dhani	14. Baudi wali Johadi, Ranawala
15. Pila Johad, Bhadaz	16. Sama khora ka Johad
17. School ki Johadi	18. Pachveer wala Johad, Chausala
19. Khora wali Johadi, Galasya ki Dhani	20. Pachveera wali Johadi
21. Khanga Gurjar ka Bandh, Toda	22. Bandi Johadi
23. Chocha wali Johadi	24. Nahar Singh ka Bandh
25. Thakura wala Bandh	26. Kani wala Bandh
27. Kani ki medbandhi	28. Sankda ka Bandh
29. Babaji wala Bandh, Bhanwata	30. Ramkishan Bhopa ka Bandh
31. Narain Bhopa ka Bandh	32. Chaju Bhopa ka bandh
33. Dhana lomodka Anicut	34. Koyali Johadi
35.Khanyali Johadi	36. Arjun ka Anicut
37. Sharwan Bhopa ka Bandh	38. Sharwan Bhopa ki medbandhi
39. Gopal tanwar ka Anicut	40. Harsahay ka Anicut, Kolayala
41. Musana wali Johadi	42. Bishana ka Kuya ka ikswali Johadi
43. Pokhar patal ka Bandh	44. Badwala Guwara ki Johadi
45. School wali Johadi	46. Bharta ki Dhani ka Johad
47. Muchand Balayee ka Anicut	48. Pheta wala khet ki medbandhi
49. Bhadri Gurjar ki medbandhi	50. Doda wali Johadi
51. Bhopa ki Dhani ki Johadi	52. Harsiwas wala Johad
53. Kankarwali Johadi, Bhuriyawa	54. Ghati tala ki Johadi
55. Nabha wali Johadi	56. Panna Gurjar ka Anicut, Khardata
57. Lalakala ki Johadi	58. Raigarwali Johadi
59. Ramdhan Meena ka Anicut	60. Ghiri wala khet ki medbandi
61. Ganwa wali Johadi	62. Gopi Meena ka Anicut, Dumoli
63. Hari singh ka Anicut	64. Mool Singh ka Anicut, Khatala
65. Ramprasad Meena ka Bandh	66. Pipal wali Johadi
67. Pachveera wali Johadi	68. Chokidara wala Johad, Sanwatsar
69. Jhalra wala Johad	70. Pachveera ki Johadi
71. Nal wali Johadi	72. Bandh wali Johadi, Nangel
73. Radi wali Johadi	74. Khodawala Bandh, Chawa ka Was
75. Gudheyawala Johad	76. Ram Talayi
77. Pagdi uper ki Johadi	78. Gasi ka Anicut
79. Mahadev ka Anicut	80. Taja wala Anicut, Darolai

81. Lalpura ka Johad	82. Lalpura ki Choti Johadi, Lalpura
83. Sanjyanath ka Johad	84. Ganwa wali Johadi
85. Gurjara ka Guwada wali Johadi, Palsana	86. Talwada ki Johadi, Chandpura
87. Benada ka Johad	88. Mandaya wali Johadi
89. Dadi wala Bandh	90. Rudaka khet ki medbandi
91. Jogio ka Johad-I	92. Jogio ka Johad-II
93. Gali ka Johad	94. Khairu wala ki medbandi
95. Bhagirath ka Anicut	96. Jabar Sagar
97. Bewdi Bandh	98. Bayesa Bandh
99. Badri Bandh	100. Nayma wali medbandi-I
101. Nyma wali medbandi-II	102. Lamoda ka Johad
103. Sadak ka pas ka Johad	104. Chari wala Bandh
105. Nagrakala ki medbandi	106. Adwa ki medbandi
107. Bharthari wala Johad	108. Ghati wala Johad
109. Chetr Meena ka khet ki medbandi	110. Nayamwala Bandh
111. Ramkumar ka Bandh, Hamirpur	112. Mota wala Johad, Paidyala
113. Pipal wali Johadi	114. Ghuggi wali Johadi
115. Jhadkha wala Bandh-I	116. Jhadkha wala Bandh-II
117. Jagarnathpura wala Bandh, Jagarnathpura	118. Mulchand Meena ka Anicut
119. Bhatala ka bandh	120. Ghati wala Johad
121. Thighrya wali Johadi	122. Patwari ka Bandh
123. Bhodhu ka Bandh	124. Rawta ka Bandh
125. Ghara ka Bandh	126. Kalu ka bandh
127. Dkalyaka ka Bandh	128. Lalolaye ka Johad
129. Kotiyo ka Johad	130. Modala ka Bandh
131. Kadla ki Johadi	132. Asudhal ki pati
133. Nalka Bandh	134. Nalka Guwadaki Johadi
135. Sharwan Meena ka Bandh, Samra	136. Kamala ka Johad, Piplay
137. Dandh ka Johad	138. Kala khet ka Johad
139. Khati wali Johadi	140. Maliayo ka Johad
141. Kunj Sagar	142. Dokriwali Talaye
143. Chorala Bandh	144. Manayakala Bandh-I
145. Manayakala Bandh-II	146. Ronjali Talayi
147. Ghankdaya wala Bandh	148. Chandhala ka Johad
149. Khari kund ka Johad	150. Khan ka Johad
151. Pipalwali Talayi	152. Kalidab ka Johad, Kaled
153. Raval Bandh	154. Lamoda ka Bandh, Davkadavra
155. Kundayala ka Johad	156. New Bandh
157. Uparla Johad-I	158. Uparla Johad-II
159. Samla kayar ka Johad	160. Bajrala Johad
161. Baksa Gurjar ka Bandh	162. Parbhat ki medbandi
163. Gajdeesh Gurjar ka khet ki medbandi	164. Kumharo wala Bandh

165. Mulchand Gurjar ka Bandh	166. Damol Singh ka khet ki medbandi, Jatpur Gujran
167. Bhojaykal ka Anicut	168. Palakua ka Johad
169. Cheelawala Bandh	170. Phtalika Johad
171. Ghojar wali Talayi	172. Kankad wala Bandh
173. Bara wala Bandh	174. Kankri wala Bandh
175. Badayala Bandh	176. Gangaram ka Johad
177. Babaji ka Johad, Nitata	178. Pachveera ka Johad, Raysar
179. Pipalwala Johad	180. Badi Johadi
181. Master ji ka Johad, Khanya	182. Tajaji ka Johad
183. Solkala Bandh, Bassi	184. Munglali Johadi
185. Karayli Johadi	186. Jadyala Johad, Dagota
187. Kagola Bandh	188. Kamalawala Bandh, Neemla
189. Bharu Meena ka khet ki medbandi, Shrinagar	190. Dakav wala khet ka Bandh
191. Nari wala khet ka Bandh	192. Mulchand ka khet ki medbandi, Thali
193. Kasolayla wala Bandh	194. Ramjilal ka Bandh
195. Sukdav Meena ka Bandh, Ramayala	196. Nath ji ki Johadi
197. Sadak uprla Bandh, Kisnala	198. Koliahli Johadi, Riksa (Jagatsar)
199. Bhagwan ka khet ka Bandh, Chatarpura	200. Nimdekala Bandh
201. Hanuman chokidar ka khet ki medbandi, Gheri	202. Laxman Nminai, Hamirpur
203. Girdhari Meena ka khet ki med-I	204. Girdhari Meena ke khet ki med-II
205. Nandi ka Bandh, Mandala	206. Randham Regar ka khet ki med-I
207. Randham Regar ka khet ki med-II	208. Randham Regar ka khet ki med-III
209. Gopal Sharma ka Bandh	210. Gopal Sharma ka khet ki med, Hamirpur
211. Radhala ka Bandh	212. Mulchand Meena ka Anicut, Samara
213. Kumharon ka khet ki med, Jaitpur Gujran	214. Chhaju Meena ka khet ki med, Hamirpur
215. Shrawan Meena ka Bandh, Thagargya	216. Brahmanon ka Johad
217. Prabhu Sharma ka Bandh, Rasala	218. Khatikan ka Johad
219. Ramji Lal Sharma ka khet ki med	220. Nyali Nala ka Bandh
221. Nahariwala Bandh	222. Kalyan barana ka khet ki med, Thali
223. Chhotu Khatik ka khet ki med-I, Nabhala	224. Chhotu Khatik ka khet ki med-II
225. Chhotu Khatik ka khet ki med-III, Thali	226. Nabhula ka Anicut
227. Dukhbhanjan ka Talab, Thali	228. Bhagawan ka Anicut, Chatarpura
229. Kala khet ka Johad, Manpura	230. Puenweeran ki Johadi, Panchbadi
231. Sravan Bhopa ki medbandi, Kolyala	232. Hanuman chokidar ka khet ki med, Jheeri
233. Bharata Gurjar ka Johad, Jaipur Gujran	234. Jhotala ka Johad, Nitata
235. Deo Narayan ka khet ki med	236. Ram Kalyan ke khet ki med
237. Jagadish ka khet ki med	238. Thakadar ka Johad, Deo ka Deovara

A. Wildlife of Arvari Catchment

(Based on observations of Forest Range Officer and Wildlife Expert in the area)

(VR = Very Rare; R = Rare; C = Common; FC = Fairly Common; A = Abundant

Re = Resident; W = Winter Visitor; S = Summer Visitor; M = Monsoon Visitor; V = Presumed Vagrant; ? = Uncertain Status; B = Confirmed Breeding)

S. No.	Scientific Name	English / Hindi Local Names	Status
Mammals			
1.	Machea mulatta	Rhesus Macaque, Bander	C
2.	Semnopithecus entellus	Grey Langur, Langoor	C
3.	Panthera tigris	Tiger, Nahar	R
4.	P. pardus	Leopard, Baghera	R
5.	Felis chaus	Jungle Cat, Jungli Billi	R
6.	F. caracal	Caracal, Syahgosh	VR
7.	Viverricula indica	Small Indian Civet	C
8.	Paradoxurus hermaphroditus	Common Palcibete	C
9.	Herpestes javanicus	Small Indian Mongoose	C
10.	H. Smithi	Ruddy Mongoose	R
11.	H. edwardsii	Grey Mongoose	C
12.	Hyaena hyaena	Striped Hyena	R
13.	Canis lupus	Wolf	R
14.	C. aureus	Jackal	C
15.	Vulpes bengalensis	Indian Fox	R
16.	Hemiechinus auritus	Long-eared Hedgehog	C
17.	Suncus murinus	Grey Musk Shrew	C
18.	Pteropus giganteus	Flying Fox	C
19.	Funambulus pennanti	Five-striped Palm Squirrel	A
20.	Rattus rattus	Common House Rat	A
21.	Mus masculus	House Mouse	A
22.	Meriones hurrianae		C
23.	Vendelewria deracea		C
24.	Golunda ellioti		C
25.	Bendicota beng alwsis		VR
26.	Hystrix indica	Indian porcupine	C
27.	Lepus nigricollis	Indian hare	FC
28.	Boselphus tregocamelus	Nilgai	A
29.	Cervus unicolor	Sambar	R
30.	Axis axis	Chital	R
31.	Sus scrofa	Indian Wild Boar	R
Birds			
1.	Francolinus Pondicerianus	Grey Francolin	R
2.	Francolinus Francolinus	Black Francolin	R

3.	Coturnix coromandelica	Rain Quail	R
4.	Galloperdix lunulata	Painted spurfowl	R
5.	Pavao cristatus	Indian peafowl	R
6.	Sarkidirnis melanotos	Comb dusck	R
7.	Nettapus coromandelianus	Cotton pygmy goose	R
8.	Anas strepera	Gadwall	W
9.	Anas crecca	Common teal	W
10.	Anas platyrhynchos	Mallard	W
11.	Anas poccilorhyncha	Spot billed duck	R
12.	Anas acuta	Northern pintail	W
13.	Anas clypcata	Northern Shoveler	W
14.	Netta rufina	Red crested pochard	W
15.	Aythya ferina	Common pockhard	W
16.	Aythya fuligula	Tufted duck	W
17.	Turnix sylvatica	Small button quail	R
18.	Dinopiun benghalense	Black rumped flameback	R
19.	Megalaima he\aemaccphala	Coppersmith barbet	W
20.	Ocyceros birostris	Indian grey hornbill	R
21.	Upupa epops	Eurasian hoopoe	R
22.	Coracias benghalensius	Indian roller	R
23.	Alcedo atthis	Common kingfisher	R
24.	Halcyon smyrnensis	White throated kingfisher	R
25.	Ceryle rudis	Pied kingfisher	R
26.	Merops philippinus	Blue tailed bee-eater	R
27.	Oxylophus jacobirus	Pied cuckoo	M
28.	Cuculus varius	Common hawk cuckoo	R
29.	Cuculus micropterus	Indian cuckoo	V
30.	Eudynamys scolopacca	Asian koel	R
31.	Phaenicophaneus leschenaultii	Sirkeer malkoha	R
32.	Centrospus sinesis	Greater coucal	R
33.	Alexandrine parakreet	Psittacula cupatria	V
34.	Psittacula krameri	Rose ringed parakreet	R
35.	Psittacula cyanocephala	Plum headed parakreet	W
36.	Apus affinis	Little swift	R
37.	Tyro alba	Barn owl	R
38.	Otus bakkamoena	Indian scops owl	V.R.
39.	Ketupa zeylomensis	Brown fish owl	R
40.	Strix occllata	Mottled wood owl	R
41.	Athene brama	Spotted owlet	R
42.	Asio flammeus	Short eared owl	W
43.	Caprimulgus Indicus	Grey nightjar	R
44.	Columba livia	Rock pigeon	R
45.	Streptopelia senegalensis	Laughing dove	R

46.	Streptopelia chinesis	Spotted dove	R
47.	Streptopelia tranquebarcica	Red collared dove	R
48.	Streptopelia decaocto	Eurasian collared dove	R
49.	Trenon phoenicoptera	Yellow footed green pigeon	W
50.	Amaurornis phoenicurus	White breasted water hen	R
51.	Porphyrio Porphyrio	Purple swamp hen	R
52.	Fulica atra	Common coot	W
53.	Pterocles exustus	Chestnut bellied sandgrouse	R
54.	Pterocles indicus	Painted sandgrouse	R
55.	Tringa tetanus	Common redshank	W
56.	Tringa ochropus	Green sandpiper	W
57.	Calidris minuta	Little stint	W
58.	Calidris temminckii	Temmincks stint	W
59.	Burhinus vedicnemus	Eurasian thick knee	R
60.	Himantopus himantopus	Black winged stilt	R
61.	Recurvirostra avosetta	Pied avocet	W
62.	Charadrius dubius	Little ringed plover	W
63.	Charadrius alexandrinus	Kentish plover	W
64.	Vanellus vanellus	Northern lapwing	W
65.	Vanellus malabaricus	Yellow wattled lapwing	V
66.	Vancllus malabaricus	Yellow wattled lapwing	V
67.	Vancullus duvaucclii	River lapwing	V
68.	Vanellus indicus	Red wattled lapwing	R
69.	Larus brunnicephalus	Brown headed gull	R
70.	Sterna aurantia	River tern	R
71.	Chlidonias hybridus	Whispered tern	W
72.	Elanus caeruleus	Black winged kite	R
73.	Milvvus migrans	Black kite	R
74.	Neophron percnopterus	Egptian vulture	R
75.	Gyps bengalenesis	White rumped vulture	R
76.	Gyps indicus	Long billed vulture	R
77.	Sarcogyps calvus	Red headed vulture	R
78.	Spilornis cheela	Crested serphent eagle	R
79.	Acciptier badius	Shikra	R
80.	Acciptier nisus	Eurasian sparrow hawk	W
81.	Butastat teesa	White eyed buzzard	W
82.	Aquila clanga	Greater spotted eagle	W
83.	Aquila heliaca	Imperial eagle	W
84.	Falco tinnunculus	Common kestrel	W
85.	Tachybaptus ruficollis	Little grebe	R
86.	Antinga inelanogaster	Oriental darter	W
87.	Phalacrocorax niger	Little cormorant	C
88.	Phalacrocorax fuscicollis	Indian cormorant	C

89.	Phalacrocorax carbo	Great cormorant	R
90.	Egretta garzetta	Little egret	R
91.	Ardea cinerea	Grey heron	R
92.	Ardea purpurea	Purple heron	R
93.	Mesophoys intermedia	Intermediate egret	R
94.	Bublcus ibis	Cattle egret	R
95.	Ardcola grayii	Indian pond heron	R
96.	Threskiornis melanocephalus	Black headed ibis	W
97.	Platalea teucorodia	Eurasian spoonbill	W
98.	Pelecanus crispus	Dalmatian pelican	W
99.	Myeteria leucocephala	Painted stork	W
100.	Anastmus oscitans	Asian openbill	W
101.	Ciconia nigra	Black stork	W
102.	Ciconia episcopus	Woolly necked stork	
103.	Puta brachyura	Indian pitta	S
104.	Culicicapa ccylonensis	Grey headed canary flycatcher	W
105.	Lanius vittatus	Bay backed shrike	R
106.	Lanius schach	Long tailed shrike	R
107.	Lanius excubitor	Northern shrike	R
108.	Dendrocitta vagabunda	Rufous treepie	R
109.	Corvus splendens	House crow	R
110.	Corvus macrorynchos	Large billed crow	R
111.	Oriolus oriolus	Eurasian golden oriole	S
112.	Hirundo smithii	Wire tailed swallow	R
113.	Hirundo daurica	Red rumped swallow	R
114.	Pyenonotus leucotis	White eared bulbul	R
115.	Pycnonotus cafer	Red vented bulbul	R
116.	Prinia hodgsonii	Grey breasted prinia	R
117.	Prinia sylvatica	Jungle prinia	R
118.	Prinia socialis	Ashy prinia	R
119.	Prinia inornata	Plian prinia	R
120.	Zosterops palpebrosus	Oriental white eye	R
121.	Orthotomus sutorius	Common tailorbird	R
122.	Phylloscopus collybita	Eurasian chiff chaff	W
123.	Chrysomma sinense	Yellow eyed babbler	R
124.	Turdoides striatus	Jungle babbler	R
125.	Turdoides caudatus	Common babbler	R
126.	Turdoides malcomi	Large grey babbler	R
127.	Sylvia curruca	Lesser whitethroat	W
128.	Mirafra cantillans	Singing lark	R
129.	Mirafra crythroptera	Indian lark	R
130.	Nectarinia asiatica	Purple sunbird	R
131.	Passer domesticus	House sparrow	R

132.	Passer hispanolensis	Spanish sparrow	W
133.	Passer montanus	Eurasian tree sparrow	W
134.	Petrnia xanthocollis	Chestnut shouldered petronia	R
135.	Motacilla alba	White wagtail	W
136.	Motacilla maderaspatensis	White browed wagtail	R
137.	Moracilla flava	Yellow wagtail	W
138.	Motallica cinereo	Grey wagtail	W
139.	Anthus rufulus	Paddy field pipit	R
140.	Anthus trivialis	Tree pipit	W
141.	Ploceus philippinus	Baya weaver	R
142.	Coracina macei	Large Cuckoo-Shrike	R
143.	Coracina malenoptera	Black-Headed Cuckoo-Shrike	R
144.	Pericrocotus cinnamomeus	Small Minivet	R
145.	Pericrocotus flammeus	Scarlet Minivet	V
146.	Rhipidura aureola	White-Browed Fantail	R
147.	Dicrurus macrocercus	Black Drongo	R
148.	Dicrurus caerulescens	White-Bellied Drongo	W,R
149.	Terpsiphone paradisi	Asian Paradisa-Flycatcher	R
150	Aegithina tiphia	Common Iora	W, R
151.	Tephrodornis pondicerianus	Common Woodshrike	Re
152.	Ficedula parva	Red-Breasted Flycatcher	W, C
153.	Cyornis tickelliae	Tickell's Blue-Flycatcher	R
154.	Luscinia svecica	Bluethroat	R
155.	Copsychus saularis	Oriental Magpie-Robin	R
156.	Saxicoloides fulicata	Indian Robin	R
157.	Phoenicurus ochruros	Black Redstart	W, Re
158.	Saxicola maura	Siberian Stonechat	Re
159.	Saxicola caprata	Pied Bushchat	Re
160.	Saxicola ferrea	Grey Bushchat	V
161.	Oenanthe deserti	DesertWheatear	Rare
162.	Cercomela fusca	Indian Chat	Re
163.	Sturnus malabaricus	Chestnut-Tailed Starling	Re
164.	Sturnus pagodarum	Brahminy Starling	Re
165.	Sturnus roseus	Rosy Starling	Rare
166.	Sturnus vulgaris	Common Starling	W
167.	Sturnus contra	Asian Pied Starling	Re
167.	Acridotheres tristis	Common Myna	Re
168.	Acridotheres ginginianus	Bank Myna	Re
169.	Parus major	Great Tit	Re
170.	Riparia paludicola	Plain Martin	Re
171.	Hirundo concolor	Dusky Crag-Martin	Re
172.	Hirundo rustica	Barn Swallow	W, Rare
173.	Lonchura malabarica	White-Throated Silverbill	Re

174.	Melophus lathami	Crested Bunting	W, Rare
175.	Emberiza buchanani	Grey-Necked Bunting	W. Rare
176.	Emberiza stewarti	Chestnut-Breasted Bunting	Re
	Reptiles		
1.	Hemidactylus flaviviridis	Northern House Gecko	FC
2.	Eublepharis macularis	Fat tailed Gecko	R
3.	Calotes versicolor	Common Garden Lizard	A
4.	Riopa punctata	Snake Skink	C
5.	Varanus bengalensis	Common Indian Monitor, Goh	C
6.	Eryx johnii	John's Earth Boa, Sawad Chaklond	C
7.	Boiga trigonata	Cat Snake	
8.	E.conicus	Russell's Earth Boa	C
9.	Xenochropis piscator	Checkered Keelback, Pani – ka-Sanp	C
10.	Spalerosophis diadema	Royal Snake	
11.	Ptyas mucosus	Ratsnake, Gurha	C
12.	Naja naja	Indian Cobra, Kala-sanp	C
13.	Echis carinatus	Saw-scaled Viper	C
14.	Chamaelon zeylanicus	Chamaelon	F
	Amphibians		
1.	Limnonectes tigerinus	Indian Bull Frog	C
2.	Limnonectes limnocharis	Cricket Frog	C
3.	Occidozyga cyanophlyctis	Skipping Frog	A
4.	Tomopterna breviceps	Burrowine Frog	C
5.	Bufo melanostictus	Common Indian Toad	R
6.	B. Stomaticus	Marbled Toad	C
	Insects		
1.		Dragon Fly	A
2.		Crickets	A
3.	Periplaneta Americana	Cockroach	R
4.		Praying Mantis	C
5.		White Ants	C
6.		Bugs	C
7.	Lipaphis erysimi	Mustard Aphid	C
8.	Anthia sexaguttata	Common Six White-Spotted Tiger Beetle	C
9.	Sternocera chrysis	Jewel-Beetle	C
10.	Tribolium castaneum		C
11.	Neocerambyx paris		C
12.		Dung-Roller Beetle	C
13.	Musca domestica	Housefly	A

14.	Anepheles sp.	Mosquito	A
15.	Culey sp.		A
16.	Apis dorsata	RockBee, Bhaur Mahuk	
17.	Mylobris sp.	Of Yellow colour	
18.	Socions Spider		
Molluscs			
1.	Unio sp.		C
2.	Lymnaea acuminata		
3.	Indoplanortis exustug		
4.	Bellamya bengalensis f. typical		C
Butterflies			
1.	Eurema hecabe	Common Grass Yellow	C
2.	Danaus chrysippus	Plain Tiger	C
3.	Lampides boeticus	Pea Blue	C
4.	Anaphaeis aurota	Pioneer	C
5.	Hypolimnag misippus	Danavid Egg-fly	C
6.	Junonia heirta	Yellow Pansy	C
Common Spiders: *Plexipus paykullu, Marpissa sp., Sparassus sp., Scytodes sp.*			
Annelida – Earthworms (*Metaphire posthuma*)			

B. Naturally Occurring Plants (Flora) in Arvari Catchment

(Based on Primary Field Work)

Habit: *T=Tree; S=Shrub; H=Herb; Cl=Climber; Cr=Creepers.*

Habitat: *Pl=Plains; Hi=Hills; S.D=Sand Dunes; Ag.F= Agriculture Fields; W=Weeds; Cu=Cultivated; F=Forest.*

Status: *F=Frequent; C=Common; A=Abundant; R=Rare.*

S. No.	Latin Name	Vernacular Names	Habit	Habitat	Status
1.	**Abrus precatorius**	Chirmi	C	F	F
2.	*Abutilon asiaticum*	Buhara	H	Pl. + Hi	C
3.	*A. bidentum*	-	H	Pl	
4.	*A. hirsutum*	-	H	Pl	
5.	*A.indicum*	-	H	Pl	
6.	*A. ramosum*		H	Pl + Hi	R
7.	*Acacia jacquemontii*	Babool	T	S.D +Pl	F
8.	*A. leucophloea*	Roonj	T	Pl + Hi	C
9.	*A. nilotica subsp. Indica*	Deshi Kikkar	T	Pl + Ag. F	C
10.	*Anilotica subsp. cupressiformis*	Kikkar / Babool	T	Pl + Ag. F	R
11.	*A. Senegal*	Kheri	T	Pl + Hi	C
12.	*A. tortalis*	Australian Babool	T	SD + Pl	
13.	*Acalypha indica*		H	Aq.	C
14.	*Acanthospermum hispidissima*	Rukdi	H	Pl	F
15.	*Achyranthes aspera*	Unga/Apamar	Pe. H	Pl + Hi	C
16.	*Acrachne racemosa*	Makro	H	Pl	
17.	*Adhatoda zeylanica*	Adusa / Vasak	S	Hi	A
18.	*Aegle marmelos*	Bel Bepatra	T	Pl + Hi	R
19.	*Aerva persica*	Bui	S	Sd	
20.	*Agave wighti*		H	Pl+hi	F
21.	*Aeschynomene indica*		H		F
22.	*Ageratum conyzoides*	Conyzoides	H	Pl+w	R
23.	*Ailanthes excelsa*	Ardusa	T	Hi+pl	R
24.	*Albizia lebbeck*	Siris, Kala siris	T T	Pl +hi Hi	C R
25.	*Alhagi pseudalhagi*		H	Pl	F
26.	*Aloe barbadensis*	Gwarpatha	H	Pl	C
27.	*Alternanthera sessilis*		H	Aq	C

28.	*Alysicarpus bupleurifolius*		H	Pl + Hi	F
29.	*A. longifolius*		H	Pl	R
30.	*A. monilifier*		H	Pl	C
31.	*A. tetragonolobus*		H	Hi	C
32.	*A. vaginalis*		H	Pl	C
33.	*Ammania baccifera*		H	Aq	C
34.	*Amaranthus gracilis*	Cholai	H		
35.	*A. polygonoides*		H	Aq	C
36.	*A. spinosus*		H	Pl	
37.	*Anagallius arvensis*		H	Pl	C
38.	*Anisomeles indica*		H	Pl + Hi	F
39.	*Annona squamosa*	Sitaphal / saripha	S	Hi	R
40.	*Anogeissus pendula*	Dhok	T	Hi	C
41.	*A. rotundifolia*	Nokh / Andh Nokh	T	Pl	R
42.	*Apluda mutica*	Lampali	H	Pl	F
43.	*Aponogeton nutans*	Ghas	H	Aq	F
44.	*Argemone maxicana*	Satyanashi	H	Pl	C
45.	*Argemone ochroleuca*	Satyanashi	H	Pl	F
46.	*Argyreria nervosa*		H	Hi	F
47.	*Aristida adscensionis*	Lampla	H	Pl	C
48.	*A. depressa*	Lampalio	H	Hi	C
49.	*A. funiculata*	Lampalio	H	Hi + Pl	F
50.	*A. mulabilis*	Lampalio	H	Hi + Pl	F
51.	*Aristolochia bracteolata*	Hukka bel	H	Fe	F
52.	*Arnebia hispidissima*				
53.	*Artemisia parviflora*		H	Pl + Hi	F
54.	*Arthraxon lanceolatus*	Ghas	H	Hi	
55.	*A. quartinianus*	Ghas	H	Hi	
56.	*Asparagus racemosus*	Nahar kanta	Cl	Hi	R
57.	*Asphodelus tenuiflous*		H	Ag F	A
58.	*Atlosia sedrataeoids*		Cl	Fe	C
59.	*Azadirachta indica*	Neem	T	Pl + Hi	C
60.	*Bacopa monnieri*		H	Aq	F
61.	*Balanites aegyptiaca*	Hingul / hingota	T	Pl + Hi	C
62.	*Bambusa arundinacea*		S	Hi	R
63.	*Barleria acanthoides*		H		
64.	*B. prionitis*		H		
65.	*Basella alba*		H	Pl	F
66.	*Bauhinia racemosa*	Jhingha	T	Pl + Hi	C
67.	*B. variegata*	Kachnar	T	Pl + Hi	R

68.	*Bergia suffruticosa*		H	Hi	
69.	*Bidens biternata*		H		A
70.	*Blastania fimbristipula*		Cl	Hi	F
71.	*B. garcini*		Cl	Hi	R
72.	*Blepharis maberaspatensis*		H	Hi	R
73.	*Blumea lacerà*		H	Pl + Hi	C
74.	*Boerhavia procumbens*	Satta	H	Pl + Sd	C
75.	*Borreria articularis*	Agio	H	Pl + Sd	C
76.	*B. pusilla*	Agio	H	Pl + Sd	C
77.	*Boswellia serrrata*	Salar	T	Hi	
78.	*Bothriochloa pertusa*	Karad choti	H	Pl	C
79.	*Brachiarea ramosa*	Kurdi	H	Pl	C
80.	*B reptans*	Chirichugo	H	Pl	F
81	*Bridelia retusa*		H	Hi	R
82.	*Buddleja asiatica*		S	Pl	R
83	*Bulbostylis bardata*	Chuhe ki munch	H	Pl + Sd	C
84	*Budea monosperna*	Dhak/chhila	T	Hi + Pl	C
85.	*Caesalpinia bonduc*		S	Pl	F
86.	*C. pulcherrima*		S	Pl	R
87	*Calligonum polygonoides*	Phog/phogra	S	Sd + Pl	R
88.	*Calotropis procera*	Hak/ deshi aakh	S	Pl+Sd+Hi	A
89	*Capparis decidua*	Kariala	T/S	Pl+Hi	F
90.	*C.sepiaria*		S	Hi	F
91.	*Carissa congesta*	Karonda	S	Hi	F
92.	*Cardiospermum halicacabum*		Cl		
93.	*Cassia auriculata*		S	Hi	F
93. A	*Casaeria elliptica*	Chilla	T	Hi	R
94.	*C.fistula*	Amaltas	T	Hi	F
95.	*C.obtusifoba*		H	Ag.f	R
96.	*C.occidentalis*		H	Ag.f	F
97.	*C.siamea*		T		C
98.	*C.sophora*		T		C
99.	*C.tora*		H	Wl+Ag.f	F
100.	*Catharanthus roseus*	Sadabahar	H		C
101.	*Citrus sp.*	Nimbu			
102.	*Cleome viscosa*	Singhali	H	Ag.f	
103.	*Cleome gynandra*		H	Ag.f	

104.	*Clerodendrum phlomoides*	Arni/Arnia	S		
105.	*Clitoria ternatea*	Kali Koyal	Cl		
106.	*Coccinia grandis*	Gol Kakri			
107.	*Cocculus hirsutus*	Pilwani bel	Cl	Hi	R
108.	*Cocculus pendulus*	Pilwani bel	Cl	Hi+Pl	R
109.	*Coldenia procumbens*		H	Hi	R
110.	*Commiphora wightii*	Guggal	S	Hi	R
111.	*Commelina benghalensis*	Mor ki Roti	H	Pl	
112.	*C.fosskalaei*	Mor ki Roti	H	Hi	
113.	*Convolvulus arvensis*		H	Pl	F
114.	*C.prostratus*			Pl	F
115.	*Corallocarpus epigaeus*		Cl	Hi	R
116.	*Corchorus aestuans*		H	Ag.f	C
117.	*C.depressus*		H	Pl	R
118.	*Cayratlra trifolic*		Cl	Hi	C
119.	*Celosia argentea*		H	Pl	
120.	*Cenchrus biflorus*	Bhroot	Pl+Sd	A	
121.	*C. ciliaris*		H	Fe	C
122	*C. pennisetiformis*	Ghas	H	Ag. F	R
123.	*C. setigerus*	Kala bharoot or kala dhaman	H	Hi	C
124	*Ceropegia bulbosa*		Cl	Pl + Hi	R
125	*Cestrum diurnum*	Din ka Raja	S	Pl + Hi	R
126	*C. nocturnum*	Raat ki Rani	S	Pl + Hi	R
127	*Chenopodium album*	Bathuwa	H	Pl + Ag. F	C
128	*Chloris prieurii*	Ghas	H	Pl	F
129	*C. virgata*	Chhoto eranio	H	Pl + Hi	f
130	*Chrozophora rottleri*		H	Ag. F	
131	*Circhorium intybus*			Fe	F
132	*Cissamelos pareira*		Cl	Fe + Hi	R
133	*Cistanche tubulosa*	Holi ka dhula	H	Sd	R
134	*Citrullus colocynthis*	Tumbra	Cl	Sd + Pl	C
135	*C. fistulosus*	Tindsi	Cl	Sd + Pl	C
136	*C. lanatus*	Matira	Cl	Sd + Pl	C
137	*Corcharus fasciculeris*		H	Hi	F
138	*C. obdorius*		H	Hi	f
139	*C. tridens*	Kaglar	H	Pl	C
140	*C. trilocularis*		H	Hi	F
141	*Cordia dichotoma*		T	Hi	F

142	*C. gharaf*	Gundi	T	Hi	F
143	*Craetiva adansonii*	Bamasa / Barna	S	Hi	R
144	*Crotalaria burhia*	Kharsana	H	Sd +Pl	C
145	*C medicaginea*	Jhojhroo	H	Ag. F	C
146	*Croton bonplandianum*		H	Pl	F
147	*Cryptostegia grandiflora*		S	Pl +Hi	F
148	*Cucumis callosus*	Kakri	Cl	Pl	r
149	*C. melo var. agrestus*	Kacheri	Cl	Pl	C
150	*C. melo var. melo*	Kacheri	Cl	Pl	
151	*C. melo var. usitatissimas*	Kacheri	Cl	Pl	
152	*C. prophetarum*		Cl	Pl	
153	*C. sativus*	Kakri	Cl	Pl	
154	*Cucurbita maxima*	Matira	Cl	Pl	
155	*C. moschata*	Kola	Cl	Pl	
156	*Cuscuta chilensis*	Amarbel	H	Pl + Hi	F
157	*C. reflexa*	Amarbel	H	Pl + Hi	F
158	*Cyamopsis tetragenoloba*	Jangali gwar	H	Ag. F	C
159	*Cynotis cristata*	Ghas	H	Aq	A
160	*Cymbopogon martini*	Ghas	H	Hi	F
161	*Cynodon dactylon*	Doob	H	Pl	C
162	*Cyperus arenarius*	Juchatari	H	Sd	A
163	*C. alulatus*	Mottangyo	H	Aq	F
164	*C. bulboss*	Mothio	H	Aq	A
165	*C. compressus*	Moth	H	Aq	A
166	*C. cuspidatus*	Moth	H	Aq	F
167	*C. difformis*	Moth	H	Aq	r
168	*C. digitatus*	Moth	H	Aq	R
169	*C. esculentus*	Moth	H	Aq	C
170	*C. flavidus*	Moth	H	Aq	C
171	*C. niveus*		H	Hi	C
172	*C. nutans*		H	Aq	R
173	*C. rotundus*		H	Pl	C
174	*C. stloniferous*		H	Hi	F
175	*C. squarrosus*		H	Hi	R
176	*Dactylocltenium aegyptium*	Makro	H	Pl	
177	*D. aristatum*	Ghas	H	Pl + Hi	
178	*D. sindicum*	Ghas	H	Pl	
179	*Dalbergia sissoo*	Shishan	T	Pl	C

180	*Datura metal*	Datura	S	Pl	C
181	*D. stramonium*		S	Pl+Hi	R
182	*Delonix regia*	Gulmohar	T	Pl	
183	*Dendrocalamus strictus*	Bans	S	Hi	R
184	*Dendrophthoe falcata*	Banda	Cl	Hi	R
185	*Derris indica*	Karanj	T	Hi +Pl	R
186	*Desmodium gangeticum*		H	Aq	F
187	*D. reprandum*		H	Aq	F
188	*D. rotusdifolium*		H	Aq	R
189	*Desmostachya bipinnata*	Daab	H	Pl+Sd	F
190	*Dichanthium annulatum*	Karad Jarga	H	Pl	C
191	*D. foveolatum*	Ghas	H	Pl	C
192	*Dichrostachys scinerea*	Barbaria	S	Fe	F
193	*Dicoma tomentosa*		H	Pl	F
194	*Digeria muricata*	Gunara	H	Pl + Ag F	A
195	*Dioscoria bulbifera*		H	Hi	R
196	*Diospyros melanoxylon*	Tendu	T	Hi	R
197	*Diospyros montana*	Gabra	T	Hi	R
198	*Digitaria ciliarius*	Jhermi ghas	H	Hi + Pl	C
199	*D. pennate*	Jhermi ghas	H	Hi + Pl	C
200	*Diptercanthus petulus*		H	Hi	
201	*Echonichloa colonum*	Makra ghas	H	Pl	
202	*E. crusgalli*	Makra ghas	H	Aq	
203	*E. stagnina*	Makra ghas	H	Aq	
204	*Echinops echinatus*		H	Pl +Hi	C
205	*Eclipta prostrata*		H	Aq	c
206	*Ehretia laevis*	Gundi	T	Hi	R
207	*Eleusine indica*	Ghas	H	Aq	
208	*Elytraria acaulis*		H	Pl	
209	*Emex spinosa*		H	Hi	
210	*Enneapogon elegans*	Ghas	H	Hi	
211	*Enteropogon dolichostachya*	Ghas	H	Hi	
212	*Eragrostis cilarius*	Sitio	H	Pl	
213	*E. gangetica*	Grass	H	Pl + Hi	
214	*E. minor*	Grass	H	Sd	
215	*E. nigra*	Grass	H	Sd	

216	*E. tenella*	Grass	H	Pl	
217	*E. tremula*	Chirip ro khet	H	Pl	
218	*E. villosa*	Grass	H	Pl+Hi	
219	*Erythrina suberosa*	Gadhas / Gadhapalas	T	Pl+Hi	
220	*Eucalyptus rudis*	Safeda	T	Pl	C
221	*Euphorbia clarkeana*	Dudhi	H	Pl	F
222	*E. hirta*	Dudhi	H	Pl	F
223	*E. caduciflora*	Dandathore	S	Hi	C
224	*E. parviflora*			Hi	F
225	*E. neriifolia*	Dandathor	S	Hi	C
226	*Evolvulus alsinoides*		H	Pl	C
227	*Fagonia cretica*		H	Pl+Hi	F
228	*Ficus benghalensis*	Bargad	T	Pl+Hi	C
229	*Ficus tementosa*	Paras peepal / Gajind	T	Hi	R
230	*F. racemosa*	Gular	T	Pl +Hi	F
231	*F. religiosa*	Peepal	T	Pl + Hi	C
232	*Fimbristylus ferruginea*		H	Hi	F
233	*F. quinqucangularis*		H	Hi	R
234	*F squarrosa*		H	Aq	F
235	*Flacourtia indica*	Kakoon	T	Hi	F
236	*Haldina cordifolica*	Haldu	T	Hi	R
237	*Hedyotis aspera*		H	Hia	
238	*Helicteris isora*	Marodphali	T	Hi	R
239	*Heliotropium bacciferum*		H		
240	*H. ellipticum*		H		
241	*H. ovalifoluim*		H		
242	*H. strigosum*		H		
243	*Hesperethuja nerarangii*	No patio ka peed	T	Hi	R
244	*Heteropogon centortus*	Surwala	H	Pl+Hi	R
245	*Hibiscus*	Cannabinus	H	Hi+Pl	
246	*H. ovalifolius*				
247	*H. rosa sinensis*		S	Pl	R
248	*Fumaria indica*		H	Pl	C
249	*Gisekia pharnaceoides*	Sureli	H	Sd	C
250	*Glinus lotoides*				

251	*Glossocardia bosvallea*		H	Aq	R
252	*Gnaphaluim luteo-album*		H	Hi	C
253	*Gomphrena celosioides*		H	Pl +Hi	F
254	*Gossypium arboreum*				
255	*Gragea maderaspatana*				
256	*Grewia asiatica*	Phalsa	S	Hi	F
257	*G.abutilifolia*	Umro	S	Hi	R
258	*G. elastica*		S	Hi	R
259	*G. flavescens*	gangeran	S	Hi	C
260	*G. subinaequalis*			Hi	f
261	*G. tenax*	Ganger	S	Hi	C
262	*G. villosa*		S	Hi	r
263	*Holoptelea integrifolia*	Papad	T	Pl +Hi	F
264	*Hydrilla verticullata*		H	Aq	C
265	*Technocarpus frutescens*	Kali dudhi	H	Hi	C
266	*Melilotus alba*		H	Ag. F	
267	*Merremia argyptia*		Cl	Pl	
268	*Millingtonia hortensis*				
269	*Mimosa namata*	Alai	S	Pl	R
270	*Murabilis jalapa*		S	Pl+Hi	R
271	*Mimusops elengi*		H	Pl+hi	R
272	*Metragyna parviflora*	Kadamb	T	Hi	R
273	*Mollugo cerviana*		H	Sd	C
274	*M nudicaulis*		H	Sd + Pl	C
275	*Momordica balsamina*		Cl	Pl	C
276	*M charatia*		Cl	Pl	R
277	*M diocia*		Cl	Pl+Hi	R
278	*Morus alba*	Sahtoot	T	Pl+hi	R
279	*Moringa oleifera*	Sahanjana	T	Pl+Hi	F
280	*Mucuna pruriens*		Cl	Hi+Pl	F
281	*Mukia maderaspatans*		Cl	Pl	C
282	*Murraya koenigii*		T	Pl	R
283	*Nerium indicum*	Lal kaner	S	Pl+Hi	
284	*Nyctanthes arbortristis*		S	Hi	R

285	*Ocimum basilicum*	Jangali tulsi / Bapchi	H	Hi	C
286	*O. sanctum*	Tulsi	H	Pl	
287	*Oligochaeta ramosa*		H	Pl	
288	*Opuntia elatior*	Nagphani	S	Pl	F
289	*Oxalis corniculata*		H	Aq	
290	*Oxystema esculentum*		Cl	Hi	R
291	*Pandanus odoratissimus*	Kowada	S	Aq+Hi	R
292	*Panicum antidotale*	Bansi (Grass)			
293	*P. maximum*				
294	*Parkinsonia aculeata*	Ghas	S	Pl	R
295	*Paspalidium flavidum*	Samo (Grass)	H	Aq	F
296	*Paspalum scrobiculatum*	Ghas	H	Aq	F
297	*Pedalium murex*	Bada gokharon	H	Pl	
298	*Pergularia daemia*			Hi	F
299	*Peristrophoe paniculata*		H		F
300	*Perotis indica*	Lampali	H	Hi+Pl	C
301	*Phoenix sylvestris*	Jangali khajoor			
302	*Phyla nodiflora*		H	Aq	C
303	*Phyllanthus emblica*	Aonwala	T	Pl+Hi	
304	*P. maderaspatensis*		H	Pl	C
305	*Physalis minima*				
306	*Plumbago zeylanica*		H	Hi	F
307	*Indigofera astragalina*		H	Hi	C
308	*I.cordifolia*		H	Pl	
309	*I.hochstetteri*		H	Pl	
310	*I.linifolia*		H	Pl	F
311	*I.linnaei*		H	Pl+Hi	C
312	*I.tinctoria*		H	Pl +Hi	C
313	*Ipomoea pesti-gridis*		H		
314	*I.nil*		Cl		
315	*I.fistulosa*	Vilayati aak	S		
316	*Jacaranda mimosifolia*			Hi	
317	*Jatropha gossypifolia*			Hi	R
318	*Justicia heterocarpa*			Hi	F
319	*Kigelia pinnata*			Hi	R
320	*Lagenaria siceraria*		Cl		f
321	*Lannea coomandelica*		T		R

322	*Lantana indica*		S	Pl+Hi	
323	*Launaea procumbens*		H	Pl	C
324	*L.resedifolia*		H	Pl	R
325	*Lawsonia inermis*	Mehdi	S	Pl	
326	*Leonotis nepctifolia*				
327	*Lepidagathis hamiltoniana*		H	Hi	
328	*Leptadenia pyrotechnica*	Kheemp	S	Sd	C
329	*Leucaena latisiliqua*	Suibabul	T	Pl	F
330	*Leucas aspera*		H		
331	*L.suffrunticosa*		H		
332	*Lindenbergia indica*		H		
333	*Lindernia ciliata*		H	Hi	
334	*Ludwigia hyssopifolia*		H	Hi	
335	*Luffa acutangula*		Cl	Pl	C
336	*L.aegyptiaca*		Cl	Pl	C
337	*Lycium barbarum*	Murali	S	Pl	C
338	*Mallotus philippensis*	Sindoor ka Ped	T	Hi	R
339	*Malva verticillata*		H	Pl	F
340	*Malvastrum coromandelianum*		H	Pl	R
341	*Mangifera indica*	Aam	T	Aq	
342	*Martynia annua*		H	Pl	R
343	*Maytenus emarginata*	Kankera	T	Pl+Sd	C
344	*Medicago sativa*		H	Pl	F
345	*Melanocenchris jacquemontii*	Ghas	H	Pl+hi	F
346	*Melia azadirach*	Meetha Neem	T	Pl	F
347	*Polyalthea longifolia*	Ashok	T	Pl	
348	*Polycarpaea corymbosa*		H	Pl	F
349	*Polycarpon prostratum*		H	Pl	C
350	*Polygala erioptera*		H	Ag. F	F
351	*Polyonum plebeium*		H	Aq	C
352	*Portulaca oleracea*		H	Ag. F	C
353	*P.suffruticosa*		H	Ag. F	C
354	*P.quadrifida*		H	Aq	F
355	*Potamogeton crispus*		H	Aq	F
356	*Prosopis chilensis*	Vilayati Babool	T	Pl+Hi	a
357	*Prosopis cineraria*	Jaanti/Khejri	T	Pl	C
358	*Psiduim guajava*	Amaroodh	T	Pl	F

359	*Punica granatum*	Anar	S	Pl	R
360	*Pupalia lappacea*		H	Pl+Hi	F
361	*Pyrostegia venusta*		Cl	Pl+Hi	F
362	*Rhus mysorensis*	Dansar/Dansaria	S	Hi	C
363	*Rhynchosia minima*		H	Fe	F
364	*Ricinus communis*	Arand/Arandi	T	Pl	C
365	*Rivea hypocrateriformis*		Cl	Pl+Hi	R
366	*Rumex dentatus*		H	Pl+Hi	R
367	*Saccharum benghalense*	Kuncha/Munj	S	Sd+Pl	C
368	*Saccharum spontaneum*	Kans	H	Sd+Pl	F
369	*Sacopetalum tomentosa*	Ajan	T	Hi	R
370	*Salmalia malabarica*	Semal	T	Hi+Pl	R
371	*Salvadora oleoides*	Jaal/pilu	T	Pl	C
372	*Salvadora persica*	Jaal	T	Pl+Hi	R
373	*Salvia aegyptiaca*		H	Pl	C
374	*Sarcostema acidum*		S	Pl+Hi	R
375	*Scirpus roylei*		H	Pl	F
376	*S. tuberosus*		H	Pl	C
376 A	*Sehima nervosum*	Siran	H	Hi	RT
377	*Securinega leucopyrus*		T		R
378	*Sericostema pauciflorum*		H	Pl	F
379	*Sesamum mulayanum*	Jangali til	H	Pl	R
380	*Sesbania sesban*		H	Aq	F
381	*Setaria pumila*	Kangricananas	H	Sd	C
382	*S.verticilliflora*	Chruchida	H	Pl	R
383	*Sida cordifolia*		H	Pl	C
384	*S.ovata*		H	Pl	C
385	*Sisymbrium irio*		H	Pl	C
386	*Solanum incanum*	Kanteli	S	Pl	R
387	*Solanum nigrum*				
388	*Solanum surallense*	Nili kanteli	H	Hi+Pl	F
389	*Sonchus asper*		H	Pl	F
390	*Sorghum halepense*	Brao	H	Pl	C
391	*Spergulia arvensis*		H	Pl	F
392	*Sphaeranthus indicus*		H	Hi	R
393	*Sporobolus diander*	Ghas	H	Pl	R
394	*Striga angustifolia*	Runkhdi	H	Sd	C

395	*S.lutea*		H	Aq	R
396	*Tabernaemontana divaricata*	Chandani	T	Pl	
397	*Tamarix aphylla*	Farash	T	Pl	R
398	*Tamarix dioica*	Jhawada	S		A
399	*Tamarindus indica*	Imli	T	Pl	F
400	*Tecoma stans*		S	Pl	R
401	*Tecomella undulata*	Rohida	T	Pl+Sd	C
402	*Tephrosia apollina*	Bansa	H	Pl+Hi	A
403	*T.hamiltonii*	Bansa	H	Pl+Hi	F
404	*T.strigosa*	Bansa	H	Pl+Hi	F
405	*T.subtriflora*	Bansa	H	Pl+Hi	R
406	*T.villosa*	Bansa	H	Pl+Hi	R
407	*Terminalia arjuna*	Arjun	T	Hi	R
408	*T.chebula*	Arjun	T	Hi	R
409	*Tetrapogon tenellus*	Ghas	H	Hi	R
410	*Tinospora cordifolia*				
411	*Tragus roxburghii*	Ghas	H	Hi	R
412	*Trianthema portulacastrum*		H	Pl	F
413	*Trichodesma amplexicaule*		H	Pl	C
414	*Trichosanthes cucumerina*		H	Pl	F
415	*Tribulus terrestris*	Gokharoo	H	Sd+Pl	C
416	*T.alatus*		H		R
417	*Tridax procumbens*	Kali dudhi	H	Hi+Pl	C
418	*Trifolium alexandrum*	Barsheem	H	Pl	A
419	*Trigonella corniculata*	Adak methi	H	Pl	F
420	*T.occulta*	Adak methi	H	Pl	F
421	*Tripogon jacquemontii*	Grass	H		
422	*Triumfeta pentandra*		H		
423	*T.rotundifolia*		H		
424	*T.tomentosa*		H		
425	*Typha angustata*	Typha	H	Aq	A
426	*Utricularia aurea*			Aq	R
427	*Vaccaria pyramidata*		H	Pl	F
428	*Vahlia digyna*		H	Pl	R
429	*Vallisneria spiralis*		H	Aq	
430	*Verbascum chilense*		H	Aq	F
431	*Verbesina encelioides*		H	Pl	F

432	*Vernonia cinerea*		H	Hi	F
433	*Vigna radiata*	Wild mung	H	Pl	F
434	*V. angulalaris*		H	Pl+Hi	F
435	*V.trilobata*				F
436	*Vitex negundo*				
437	*Withania coagulans*	Padalsi	H	Pl	F
438	*W.somnifera*	Padalsi / Ashwagandha	H	Fe+Pl	F
439	*Wrightia tinctoria*	Dudhi	T	Hi	R
440	*Xanthium indicum*		H	Pl+Hi	F
441	*Zaleya govindia*	Kala satta	H	Pl	F
442	*Ziziphus mauritiana*	Ber ki jhari	T	Pl	C
443	*Ziziphus nummularea*	Jhari	S	Pl+Sd+Hi	C
444	*Adiantum caudatum (Pteriodophyte)*	Hans Raj	H		

Annexure VIII

Field Survey Format

Information to be collected for each village surveyed. (Special mention should be made of all places of interests, sacred groves and forest ecosystems in a note.)

Village Profile.

1. Name of village.
2. Panchayat Samiti.----
3. Tehsil ---
4. District.
5. State.....
6. Population--
7. Number of households.----
8. Total village area--------
9. Agriculture land-------
   - Irrigated land.--------
   - Unirrigated land------
   - River / tank bed ----------

10 Forest land ----------

11 Pasture land & waste lands----------

12 Accessibility- Pucca .road/ rail ----------

13 Post office.---------

14 Water sources------(River/ Well/ Nulla/ Pump

15 Medical facility.-----

16 Traditional remedies----------

17 Educational institute--------

18 Protected areas-----Swanctuary/ RF/ PF

Name of person collecting information.----------

Date of collecting information.----------

Table 2

Utilization of Bio-diversity by various user groups and the type of impact they leave on the Biodiversity

Name of Village _____

User Group	Tribal/ Non tribal.	No. of H.H	Main Occupation	negative	positive	Values
Cultivators						
Cattle breeders						
Land less laborers						
Black/ Gold, smiths						
Potters						
Small traders Basket weavers						
Leaf plate makers						
Tanners of leather						
Chippas / Rangrej						
Any other occupation						

Name of person collecting information.----------

Date of collecting information.----------

Table- 3.

List of knowledgeable individuals in the village.

S.no	Name of person	community	Field of knowledge
1	xyz	Baoria	Wildlife behaviour
2	abc	Meena	Medicinal plants etc.
3			
4			

N. B.This list should include village vaidya, hakim, bhopa, VLWs, Priests, Social workers, Midwife etc.

Name of person collecting information.----------

Date of collecting information.----------

List of plants used by the villagers for various purposes.

S. No.	Local name 0f plant	Latin name	Type of plant (Tree/Shrub/ herb/ grass	Used for *

List should include all the plants used by the village community. Species used for afforestation etc and their impact on other species should also be mentioned.

N.B. Write T for timber, Fd for fodder, Fl. For flowers, Fw for fuel wood, MFP for non timber forest produce, Med for medicinal uses.

Name of person collecting information.----------

Date of collecting information.----------

Table – 5.

Agricultural Biodiversity.

Crops grown in the village----------

S. No.	Cereal	Local variety (name if any)	Improved seeds (name if any)	Remarks. Since when cultivated and why ?
1	Rice			
2	Wheat			
3.	Jowar			
4.	Bajra.			
5	Maize			
6	Barley			
7	Gram			
8.	Local food grains			
9	Ground nut			
10.	Til			
11.	Mustard			
12	Rape seed			
13.	Other oil seed			
14	Sugar cane			
15	Ginger			

P.T.O.

16	Pulses if any			
17	Spices			
18	Other crops			
19				
20				
21				
22				
23				

N.B. Information about any industry (Cottage or Small) based on forest produce to be specially mentioned.

Name of person collecting information.----------

Date of collecting information.----------

Table 6

Information about Live stock & Poultry; -

Village ----------

S.N.	Cattle	Breed	Remarks
1.	Cow		
2	Buffalo		
3	Sheep		
4	Goat		
5	Horse		
6	Camel		
7	Donkey		
8	Drought cattle		
9	Poultry		
10	Pig		
11	Others		
12			

Add rows and columns as per local needs.

Name of person collecting information.----------

Date of collecting information.----------

ARAVALLI

MINISTRY OF ENVIRONMENT & FORESTS

NOTIFICATION

New Delhi, the 7th May 1992

(Under Section 3(1) and 3(2) (v) of the Environment Protection) Act, 1986 and rule 5 (3) (d) of the Environment (Protection) Rules, 1986 restricting certain activities in specified area of Aravalli Range, which are causing Environmental Degradation in the Region.

S.O. 319 (E) - Whereas a Notification under section 3 (1) and section 3 (2) (v) of the Environment (Protection) Act, 1986 (29 of 1986) inviting objections against restricting certain activities in specified area of Aravalli Range which are causing Environmental Degradation in the Region was published in the Gazette of India, Part II-Section 3 Sub-section (ii) vide S. O. 25 (E) dated 9th January, 1992;

And whereas all objections received have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2), of section 3 of the Environment (Protection) Act, 1986 (29 of 1986), read with rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby prohibits the carrying on of the following process and operations, except with its prior permission, in the areas specified in the Table appended to this Notification:

i. Location of any new industry including expansion modernisation;

ii. (a) All new mining operations including renewals of mining leases.

(b) Existing mining leases in sanctuaries/national Park and areas covered under Project Tiger and/or

(c) Mining is being done without permission of the competent authority.

iii. Cutting of trees;

iv. Construction of any clusters of dwelling units, farms houses, sheds, community centres, information centres and any other activity connected with such construction (including roads a part of any infrastructure relating thereto);

v. Electrification (laying of new transmission lines).

2. Any person who desires to undertake any of the above mentioned processes or operations in the said areas, shall submit an application to the Secretary, Ministry of Environment and Forests, New Delhi, in the attached application form (Annexure) specifying, inter alia, details of the area and the proposed process or operation. He shall also furnish an Environment Impact Statement and an Environmental Management Plan along with the application and such other information as may be required by the Central Government for considering the application.

3. The Central Government in the Ministry of Environment and Forests shall, having regard to the guidelines issued by it from time to time for giving effect to the provisions of the said Act, grant permission within a period of three months from the date of receipt of the application or where further

information has been asked for from the applicant, within a period of three months from the date of the receipt of such information, or refuse permission within the said time on the basis of the impact of the proposed process or operation on the environment in the said area.

4. For seeking permission under this Notification, an application in the prescribed form (see Annexure), duly filled in, may be submitted to the Secretary, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, Lodi Road, New Delhi.

[No. 17/1/91-PL/IA]

R. RAJAMANI, Secy.

TABLE

Areas where carrying on of processes and operations without permission is prohibited

i. all reserved forests, protected forests or any other area shown as "forest in the land records maintained by the State Government as on the date of this notification in relation to Gurgaon District of the State of Haryana and the Alwar District of the State of Rajasthan.

ii. All areas shown as: -

a. Gair Mumkin Pahar, or
b. Gair Mumkin Rada, or
c. Gair Mumkin Behed, or
d. Banjad Beed, or
e. Rundh.

in the land records maintained by the State Government as on the date of this notification in relation to Gurgaon district of the State of Haryana and the Alwar district of the State of Rajasthan.

i. all areas covered by notifications issued under section 4 and 5 of the Punjab Land Preservation Act, 1900, as applicable to the State of Haryana in the district of Gurgaon up to the date of this Notification.

ii. all areas of Sariska National Park and Sariska Sanctuary notified under the Wildlife (Protection) Act, 1972 (53 of 1972).

ANNEXURE

APPLICATION FORM

1. (a) Name & address of the project proposed:

   (b) Location of the project:

   Name of the Place:

   District, Tehsil:

   Location Map:

   (c) Alternate sites examined and the reasons for the site proposed:

2. Objectives of the project:
3. (a) Land Requirement:

   Agriculture land:
   Other (specify):

   a. (i) Topography of the area indicating gradient, aspect & altitude.

ii. Erodability classification of the proposed land.

b. Pollution sources existing within 10 km. Radius.

c. Distance of the nearest National Park/Sanctuary/Biosphere Reserve/Monuments/heritage site/Reserve Forest:

d. Rehabilitation plan for Quarries/borrow areas :

e. Green belt plan.

f. Compensatory afforestation plan.

1. Climate & Air Quality*:

   a. Wind rose at site:
   b. Max. /Min./Mean annual temperature.
   c. Ambient air quality data:
   d. Nature & concentration of emission of SPM, Gases (CO, CO_2, SO_2, NO_x etc.) from the project:

1. ** (a) Water balance at site surface and ground water availability and demand:

   a. Lean season water availability:
   b. Water source to be tapped with details of competing users (Rivers, lake, Ground, Public supply):
   c. Water Quality:
   d. Changes observed in quantity and quality of water in the last 15 years and present charging and extraction details:
   e. (i) Quantum of waste water to be released with treatment details:

      i. Quantum & Quality of water in the receiving water body:

ii. Erodability classification of the proposed land.

b. Pollution sources existing within 10 km. Radius.

c. Distance of the nearest National Park/Sanctuary/Biosphere Reserve/Monuments/heritage site/Reserve Forest:

d. Rehabilitation plan for Quarries/borrow areas :

e. Green belt plan.

f. Compensatory afforestation plan.

1. Climate & Air Quality*:

   a. Wind rose at site:

   b. Max. /Min./Mean annual temperature.

   c. Ambient air quality data:

   d. Nature & concentration of emission of SPM, Gases (CO, CO_2, SO_2, NO_x etc.) from the project:

1. ** (a) Water balance at site surface and ground water availability and demand:

   a. Lean season water availability:

   b. Water source to be tapped with details of competing users (Rivers, lake, Ground, Public supply):

   c. Water Quality:

   d. Changes observed in quantity and quality of water in the last 15 years and present charging and extraction details:

   e. (i) Quantum of waste water to be released with treatment details:

      i. Quantum & Quality of water in the receiving water body:

ii. Quantum of waste water to be released on land and the type of land:

6. Solid Wastes:

(a). Nature & quantity of solid wastes generated:

(b). Solid waste disposal method:

7. Noise & vibrations:

a. Sources of noise & vibrations:
b. Ambient noise level:
c. Noise & vibration control measures proposed:
d. Subsidence problem, if any, with control measures:

6. Power requirement indicating source of supply; complete environmental details to be furnished separately, if captive power unit proposed:
7. Total labour force to be deployed with details of:

- Endemic health problems in the area.
- Health care system proposed:

10. (a) Number of families and population to be displaced :
(b) Rehabilitation Master Plan:

11. Risk assessment report:

12. (a) Environmental Impact Assessment Report :

a. Environmental Management Plan: Prepared as per Guidelines of MEF issued from time to time.
b. Detailed Feasibility Report:
c. Proposal for diversion of Forestland under Forest (Conservation) Act, 1980 including Benefit Cost analysis.

13. Recommendations of the State Pollution Control Board and/or the State Department of Environment & Forests.

Signature of the Applicant
Along with name, date and
full Postal address.

*Data may be obtained from India Meteorological Department and State Pollution Control Board.

**Ground water Board and the Irrigation Deptt. May be contacted for data.

N.B.

A. Item Nos. 3(c), 4, 5, 6, 7, 8, 9, 10, 12 (b) and 12 (c) are not applicable to cutting of trees.
B. Item Nos. 3(c), 4, 7, 11 are not applicable to construction of cluster of dwelling units, farm sheds, community centre and any other activity connected with such construction including roads.
C. Item Nos. 3(b), 3(c) (3e), 3(f), 4, 5, 6, 7, 9, 12(a) & 12(b) are not applicable to electrification.
D. All items to be furnished in case of mining, industry, thermal power, transport projects.
E. Notwithstanding the above, any item(s) considered not applicable may be so indicated along with reasons.

*****

Annexure X

To
The Supreme Court
Chief Justice
New Delhi

Sub. Illegal Mining in Gair-Mukking Rada At Khasra No. 192 Vill-Mallana, Dist-Alwar (Rajasthan)

Sir,

In connection with the above we all submit the following: At a distance of half kilometer away from MANGALSAR DAM illegal mining is going on unabated. This has jeopardised the whole econological system in the nearby area. Apart from causing harm to the canals roads, residential colonies, forests and grazing land.

The above mentioned mining is an open case of total disobedience of gazette issued by the Hon'ble President of India on 07th May, 1992.

We all earnestly request your goodself to put an end to this illegal mining without further delay, otherwise we will be compelled to resort to agitation and other non-violent measures.

ALL RESIDENTS OF VILLAGE MALLANA

To
The Supreme Court
Chief Justice
New Delhi

Sub: **Closing Down of Illegal Mining Going on near Tiraha of Village Mallana under Section 133 of CRPC**

Sir,

In connection with above we all submit the following:

1. M/S BHIMSEN GARG has purchased land near khasara no. 185 at Tiraha of Vill. Mallana for mining purposed. This mining is being done near Khasra no. 187 & 188, which is Abaadi Area or residential areas. This illegal mining has posed a very serious threat to the lives of people, animals apart from danger to the eco system. It has become all the more difficult to live in these residential areas and on the land provided to the khatadaars, moreover mining in the Aabadi area is violation of the laws. So it is justificed to close down this mining business.

2. M/S. Garg Marbles is involved in illegal mining which is being done near house of Mr. Ramchandra Meena S/o Shr. Harnarayan Meena. Moreover residential plots, baras, khatadari land are also very closeby. During heavy blasting stones are hurled in all directions as a result people get injured. Blasting of mines has created cracks in the house of Mr. Ramchandra Meena.

   Life has really become miserable under these circumstances. This act of mining is really a public nuisance, it should be stopped immediately.

3. Quite similar to the above, Triveni Marbles is also operating illegal mining near Khasra no. 192 & 192/855 which are 'Gair mumkin rada' near pucca road. Heavy blasting has made it difficult for the passers by use the road. Illegal mining is being done on both sides of the road leading to Mallana Village. This too is a public nuisance. Which should be done away with immediately.

4. Mines department has issued leases to these honours of mines without measurement & Khasra Nos to carry out mining. Hence these mines honours are using 'Gochar', public land, & lands belonging to PWD for mining. The debris of mines is being dumped here and there which again has created public nuisance. Likewise, this mining process has posed great threat to the Mangalsar Dam which is situated quite nearby. Any damage to the dam wouble mean water crises to a number of villages of the area. If no attention is paid to the situation, while there is yet time, the results would be very alarming & disasterous. And any action against these mines honours will by all means be rightful.

5. Village Mallana is situated within Sariska & Wild life sanctuary apart from Sariska Tiger Project, and as per Cassette issued by Hon'ble President of India on 07th May, 1992 certain areas have been specified in Aravali Range, where any activity which is detrimental to the environment and ecological system is totally banned and as a matter of fact subject mines falls within these specified area. Vide Section ....

   Inspite of all these, mining is being done as usual, we all demand stringent action against mines department.

LII

Activities like mining etc. will affect the area very severely. Several of bad impacts of the mining work in the area are as under:–

(i) Damage to the adjoining Mangalsar Dam by blasting during mining.

(ii) Damage to the Dam will severely create water scarcity in the area for drinking as well as irrigation purpose affection more than 1 lakh people as water level will go down very badly if the Mangalsar Dam is affective by mining activities and it can be said with certainty that the Dam will be affected if Mining is permitted within the 400 to 500 metres of DAM.

(iii) It will cause displacement of more than 30 thousand people belonging to 10 villages which are mostly from tribal and downtrodden society.

(iv) Soil erosion and Descrtification of at least 60 thousand Bigha Land certain activies in the notified (or specified) areas of Aravali range whichn are adversely affecting the environment of the staff are totally banned under rule 3 (1) and 3 (3) (f) of environment (Preservation) Act 1986 and rule 5(3) (D) of environment (Preservation) Act 1986. It is clear from these provisions that Mining work is totally banned in this area.

(v) Severe damage to the ecological balance of the Sariska Tiger Project there by affecting the habitats of the project.

(vi) Law & Order problem in the area may be a major cause of concern if mining activities in such area are permitted.

6. Mining is being done on the land belonging to village Mallana, irrigation department, PWD, revence deptt., Panchayat of Mallana but we are very sorry to say that none of the above is pained any heed to this, rather they are adopting cavalier attitude. The all should be asked to give their explannation.

7. Sir, in view of the above situation should be given a very serious thought & appropriate action should be taken against M/S. Garg Marbles, Triveni Marbles, Parikh Marbles etc. and others which are against the law and they should be booked under section 133 CRPC being public & private nuisance. Moreover M/S. Garg Marbles should be directed to provide adequate compensation to Mr. Ramchandra Meena for causing damage to his house. And whosoever is (like any Govt. servants, Patwari, Girdavar, Kanoongo, Officers, Surpanchs, PWD, Forest Deptt, Irrigation Deptt) involved in this case should be asked to give detail reports and if found guilty suitable punishment should be meted out in accordance with the law.

8.

ALL RESIDENTS OF VILLAGE MALLANA

To,
Member Secretary
Central Empowered Committee,

Hon'ble Supreme Court orders, writ petition civil 2002 / 95 and 171 / 96.

Ministry of Environments & Forest
C.G.O. Complex,
New Delhi.

Sir,

As you know that Tiger Project Sariska and Jamua Ramgadh Wild Life Sanctuary both the forest area is attached with each other. Added to this both these forest are of same type. The east of Jamua Ramgadh and west & south of Sariska is touching each other and animals from both the forest area move around in the territory of both the forest and important fact is that the corridor of these two forest are the same. Now the mining operation is going on inside the forest land of both Sariska and Jamua Ramgadh Sanctuary. For this situation following concerned persons are responsible:

1. Chief Secretary, Rajasthan, Jaipur.
2. Principal Chief Conservator of Forest, Van Bhawan, Vaniki Path, Jaipur.
3. Secretary, Mining Department, Secretariat, Jaipur.
4. Secretary, Forest Department, Secretariat, Jaipur.
5. Director Tiger Project, Government of India.

They are solely responsible for the present situations for the mining activities been carried out without any hindrance from any corner of the Government. In the mid of the Sariska Forest in Ajabgadh forest area the work is going on to build a five star hotel inside the Sariska Forest and continuous mining operation is been done in the village Mallana. Same way inside the Jamua Ramgadh Sanctuary the Marble mining is been done. On August 21st 1998 an order was passed in the light of the Supreme Court, New Delhi decisions from the office of District Collector to close all the mining operations operating in the forest area since they were being carried out in the forest area. But still in all these areas mining is being carried out without any hindrance. The Mining being done in the forest land of Rajasthan is very dangerous for the survival of the wild life animals and for the common future of human beings. So it should be stopped immediately and legal actions should be

taken against all the five above-mentioned departments who are solely responsible for the on going mining operations.
The mining being done in the Sariska Tiger project area as per the notification May 7th, 1992, all these five categories mentioned below is being declared as the Forest Area.

(a) Gair Mumkin Pahar, or
(b) Gair Mumkin Rada, or
(c) Gair Mumkin Behed, or
(d) Banjad Beed, or
(e) Rundh

All the Illegal mining operation in the Sariska Forest area, which is, going on without the permission from the Government of India, violating the forest law are as follows:

1. Garg Marble
2. Kuhu Marble
3. Triveni Marble
4. R.K. Marble

Same way the illegal mining operating within the reserve forest of the Jamua Ramgadh Sanctuary as follows:

1. Aandhi Marble
2. R.K.Marble
3. Aggarwal Marble
4. Arpit Marble
5. Jaipur Marble
6. Paliwal Exclusive Marble
7. Sruti Marble
8. Surabhi Marble
9. Madhusudan Marble

And many more marble companies are operating mining in the reserve forest area. So we request kindly to take immediate actions to close all the mining operation immediately in the Sariska Forest Area and the Jamua Ramgadh Wild Life Sanctuary.

Submission and Prayed

1. The mining in the aforesaid area comes inside the forest area and contrary to the Supreme Court order in the writ petition (civil) 202 / 95 and 171 / 96 in the case of T.N.Godavarman Thirumalpad Vs Union of India and other Environment Awareness Forum Vs State of J & K.

2. The mining in the aforesaid areas is contrary to the Union of India's notification of 7th May 1992 and all the mining being operated comes under the forest area.

3. All the mines are threatening to the existence wild life both in the Sariska Forest and the Jamua Ramgadh Wild Life Sanctuary because this area is the corridor of the Jamua Ramgadh and Sariska Forest.

4. The said mining is affecting the livelihood and destroys the environment and the ecology for our common future.

5. The said mining is inimical to the rights of the people of the nation and the environment under Article 21 of the Constitution of India.

Hope concrete actions will be taken with immediate effect to stop further damage to environment, forest, and wild life of Sariska and Jamua Ramgadh forest area.

Petitioner

1.All Resident of village Mallana, for (Sariska Forest Area)
Shri Jai Ram Meena
A –33/519, Air India Colony,
Vasant Vihar, New Delhi-110057.

2. Shri Ambuj Kishore for (Jamua Ramgadh Sanctuary)
34/46, Kiran Path, Mansarovar, Jaipur-302020
Email: jalbiradari@rediffmail.com

Dated: 26.09.2002

Enclosures: 1. Illegal Mining in Gair- Mumkin Rada at Khasra No. 192 Vill- Mallana, Dist- ALwar (Rajasthan)
2. Closing Down of Illegal Mining going on near Tiraha of Village Mallana under Section 133 of CRPC.

BY REGISTERED POST

To
The Secretary
Ministry of Environment and Forest
Government of India
Paryavaran Bhawan
CGO Complex, Lodi Road
New Delhi

The Secretary
Deptt. of Mines & Geology
Govt. of Rajasthan
Vidhan Sabha,
Jaipur (Rajasthan)

The Secretary
Government of Rajasthan
Public Work Department
Vidhan Sabha,
Jaipur (Rajasthan)

The Secretary
Government of Rajasthan
Forest Department
Vidhan Sabha,
Jaipur (Rajasthan)

SUBJECT ; Illegal mining affecting lives of people
Of Malana village.

Sir,

1.That the grievances of the villages of Malana is being submitted herein. It has been noticed by the villagers that several mining activities are going on by the following and the villagers have already submitted representation to the Hon'ble

Chief Minister, Government of Rajasthan, Jaipur and the President of SC/ST Commission regarding the same.

2. Those mining activities in the Alwar District near Sariska are illegal and violative of the union government dated 07.05.1992 wherein mining activities in the Aravali specified area of Alwar region has been prohibited by the Central Government without prior permission. Inspite of the same the villagers of Malana have been noticed that illegal mining activities are being carried on by several mines. These events are being brought to your notice so that immediate action may be taken failing which suitable legal action may have to be taken regarding the same.

3. In the year 1992 the Hon'ble Supreme Court has passed orders prohibiting mining in the Sariska area ,the Ministry of Environment and Forest by Gazette Notification dated 07.05.1992 under Section 3(1) and 3(2)(5) of the Environment Protection Act 1986 and Rule 5(3)(d) of the Environment Protection Rule 1986 restricted certain activities in specified area of Aravali range Alwar Dist near Sariska range which are causing environmental degradation in the region. Under the above notification Central Government prohibited the carrying on of mining and other activities and operations except with its prior permission, specifically in the areas specified in the table appended to the Notification.

4. If any person is desirous of undertaking any process or operation he has to submit an application in the form prescribed to the Secretary, Ministry of Environment and Forest, New Delhi.. The area where carrying on the notified processes and operation without permission is prohibited are as under:

"

(i) All reserved forests, protected forests or any other area shown as forest in the land records maintained by the State

Government as on the date of this notification (7.5.1992) in relation to Gurgaon District of the State of Haryana and the Alwar District of the State of Rajasthan.

(ii) All areas shows as :-

(a) Gair Mumkin Pahar, or

(b) Gair Mumkin Rada, or

(c) Gair Mumkin Behed, or

(d) Banjad Beed, or

(e) Rundh

In the land records maintained by the State Government as on the date of this notification in relation to Gurgaon district of the State of Haryana and the Alwar District of the State of Rajasthan.

(iii) All area covered by notifications issued under section 4 and 5 of the Punjab Land Preservation Act, 1900, as applicable to the State of Haryana in the district of Gurgaon up to the date of this Notification.

(iv) All areas of Sariska National Part and Sariska Sanctuary notified under the Wildlife (Protection) Act, 1972 (53 of 1932). "

5. In the Alwar District of the State of Rajasthan not only the forest area but also Gair Mumkin Rada and all area of Sariska National Park and Sariska Sanctuary notified in the Wildlife Protection Act 1972 are prohibited area.

6. Quite apart from the violation of law,the said mining is a violation of the effected villagers right to livelihood,habitat and environment.

7.In this regard ,the Sarpanch, Gram Panchayat Toda, Jai Singhpur, P.S. Rajagarh, Alwar sent a representation to the Chief Minister, Govt. of Rajasthan, Jaipur and copies of the same has been enclosed to the District Collector, Vigilance Deptt., Alwar and the Chief Secretary of Government of Rajasthan, Jaipur.

8. The Mangalsar dam in village Malana is a government property costing crores of rupees by which many villages like Malana, Tilwad, Palpur, Thapa, Dudhpuri, Gordhanpura, Kakrali, Rampura gets irrigation and many other villages life Khoh Toda Jaisinghpura, Ghatada Asan, P.S. Berli, Bohdikuai are also receiving water from the Dam.

9. The following Kasaras are effected by the illegal mining going on.In Khasra No. 195 is very close to the "Pal" wal of the Dam. Khasra No. 196 which is (Gair Mumkin Mori) which is opening point of the dam water. Khasra No. 197 (Gair Mumkin Kund the Storage Tank No. 1 of Mangalsar Dam) and in Khasra No. 198 (Gair Mumkin Kund the Storage Tank No. 2 of Mangalsar Dam) are affected by the illegal mining. Khasra Nos. 203, 170 & 160 are all part of the canal.In which in khasra no 203,a canal exists . In khasra no 170 their is also a Canal. In Khasra no 160 another canal is being affected by the mining activities. In Khasra No. 172 a road of Public Work Department which is going to village Malana is also being affected by the mining activities. The mining process in the

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mine is extensive and deep and affecting and under the Public Work Department road going to Malana .

10. The lands which are Khasra Nos. 195, 192/855, 187, 188, 189 are the residential area in the vicinity of which the mining activities are being done. The explosion of rock is being done everyday to cause great danger to the life and property of citizen and cattles. Mining has to be done at the distance of 300 meters from the residential area but this is not the case.

11 In Khasra No. 193 which is a mountain under the Forest Department, the mines are being carried out by Garg Marbles and Chowdhary Marbles who are working their mines continuously .But the Forest Department is also not taking any action. The grazing field in Khasra No. 151/802, 152/764 are being used by the miners for throwing debris. Further ,in Khasra Nos. 192, 189, 182, 183, 184 and 185 are the mining work is being done and debris of mining has been indiscriminately scattered . This is totally in contradiction of the 07.05.1992 Notification by the Department of Environment which was made for the Sariska forest and for Gurgaon.. It is also contrary rights of the villagers to a clean and safe environment under Artical 21 of the Constitution of India.

12. It is submitted that Mangalsar Dam of district Alwar has a filling capacity in a about 46 feet and is a cement concrete dam. The mining activities is being done at about a kilometer or lesser distance.Due to dangerous blasts and explosions a crack has already developed in the dam. It has been noticed by the villagers that in the village Gordhanpura no grazing land has been left for the purpose of grazing cattle due to the illegal mining that has been carried on. The Revenue Department seems to be in collusion with the miners and have not under taken spot inspection in accordance with law.

13. The illegal activities of mining are being conducted by the following :

1. Garg Marble:

That Garg Marble is carrying on mining activities in Khasra No. 185. The same is adjacent to residential area which are Khasra No. 183, 184, 189, 185/855. On the North of Khasra No. 185, there is the protected prohibited area of Tiger Project (Sariska Forest) on the south the excavation is affecting the road on south-west. There are residential premises or residential area and on the East the Kuhu Marble is carrying on the mining activities. The villagers of village Malana have been seening that the mining activity is approaching Public Work Department road on the South and the residential area and Gair Mumkin Rada also.

That Garg Marble has also illegally taken over the mining activities that was being conucted by Suresh Kalra and is carrying on mining in Khasra No. 192 which is a notified land and has also started excavation activities in the residential areas namely Khasra No. 191 and 189/853. It is also doing illegal excavation under Khasra No. 172 which is within the limit of Public Work Department Road.

2. Kuhu Marble:

Kuhu Marble are carrying on excavation in Khasra No. 192 and Khasra No. 193 which is rock area on the North adjacent to the Sariska Forest land. There is no pillar or marking on the spot which clearly shows that the mining excavation activities are illegal. It is also putting wastage in forest area and Gair Mumkin Rada.

3. Triveni Mable:

Triveni Marble is carrying on excavation in Khasra No. 192 and in the garb of doing the same is encroaching upon Khasra No. 192/855 which is residential area and also on Khasra No. 172 which is the road maintained by Public Work Department which is main connecting link between several villages. The road leads to Malana Traya and other villages.

4. R.K. Marble:

The villagers of Malana have noticed that R.K. Marble is illegally without any permission encroaching upon Khasra No. 192 of notified land and Khasra No. 192/855 which is residential in nature is one of the largest mining operation in the recent past. Many threat are being given to the villagers not to object to the mining activities. It is submitted that the mining activities of R.K. Marble touches on many places including the Public Work Department road leading to the Mangalsar Dam and also another road on one side and it is also adjacent to the Sariska area of the Tiger Project area. Many portions of the residential area is also being excavated by R.K. Marble. The Excavation and blast are going on very close to Mangalsar Dam. It is relevant here to point out that World Bank has given 2.5 crores towards modernisation and renovation of three dams of which Mangalsar dam is one. The same has been published in Alwar Bhaskar News Paper on 30.5.2002.

The above stated facts clearly shows that inspite of representation given by the villagers Malana to many State Government Departments and also the Central Government, Ministry of Environment and

Forest have not been taking suitable action regarding the illegal mining activities that are being carried out in the Malana village. The earlier representation dated

clearly shows there have been lapses by the Department of Mines, Irrigation, Public Work Depart, Forest Department, Revenue Department, the Caretaker Mangalsar Dam, and also the Gram Panchayat Malana. As the representation given to the Chief Minister of Government of Rajasthan at Jaipur December 2001 clearly undertakes, no suitable and appropriate action is being taken. Inaction pursuance to this representation would constrain approaching the legal form for appropriate legal remedy. A prayer against erring government officials may also have to be made.

Submission and prayed

It is respectfully submitted that ;

1} the mining in the aforesaid areas is contrary to the Union of India's notification of 7th May 1992.

2} after what in addition the said mining is inimical to the rights of the villagers and environment under Article 21 of the Constitution of India.

3}the said mining is effecting the livelihood and the living environment of the villagers.

As such it should be stopped forthwith in the public interest. If prompt action is not taken the undersigned would have to take further action in accordance with law.

Dated

yours sincerely

CENTRAL EMPOWERED COMMITTEE

CONSTITUTED BY THE HON'BLE SUPREME COURT OF INDIA
IN WRIT PETITIONS NO. 202/95 & 171/96

Room No. 106, Paryavaran Bhawan, CGO Complex, Lodi Road, New Delhi 110003 Telefax-4383976

F.No. 1-5/CEC/SC/2002/ Dated: 23.11.2002

To

The Chief Secretary
Government of Rajasthan
Jaipur

Sub: - Application No. 16 Illegal Mining In Gair-Mumkin Rada at Khasra No. 192 Vill. Mallana, Dist. Alwar, Rajasthan.

Sir,

In view of the Hon'ble Supreme Court Orders 30.10.2002 and subsequently clarified on 18.11.2002, the 5 mines, which are the subject matter of the above mentioned application filed before the Central Empowered Committee, shall immediately be closed, if not already done. No movement of any mined-mineral from any of these mines shall be allowed, being part of the process of mining. As assured by the representatives of the State Government during the hearing held on 22.10.2002, it shall be ensured that none of the structures, including residential dwellings are destroyed or damaged while closing the mines.

Thanking you,

Yours faithfully,

(M.K.Jiwrajka)
Member Secretary

Copy to :

(i) The Principal Secretary, Forest, Govt. of Rajasthan
(ii) The Principal Secretary, Mining, Govt. of Rajasthan

To be handed to Shri AA Gokhle, Chairman FAC on tour to Pune

From N.K. Joshi

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CENTRAL EMPOWERED COMMITTEE

CONSTITUTED BY THE HON'BLE SUPREME COURT OF INDIA
IN WRIT PETITION (CIVIL) NO. 202/95 AND 171/96

Room No. 106, Paryavaran Bhawan, CGO Complex, Lodi Road, New Delhi- 110003 Telefax # 4363976

NOTICE FOR HEARING

Please take notice that the following I.A. / matters filed in Writ Petition (Civil) No. 202/95 before the Hon'ble Supreme Court of India which have been transferred before the Committee and applications filed before the Committee have been fixed for hearing in Room No. 403, 4th Floor, Paryavaran Bhawan, C.G.O. Complex, Lodi Road, New Delhi- 110003 **at 2.30 p.m. onwards** on the dates mentioned below. The Concerned applicants / respondents may appear to present their cases before the Committee.

In case they want to file additional documents in support of their cases the same should be filed atleast three days before the date of hearing.

In case they fail to appear on the date fixed for hearing, the matter will be heard exparte without further notice.

I. IA's transferred to Central Empowered Committee

S.No.	I. A. No.	Application for	Filed by	On behalf of	Date of Hearing
1	434	Application for direction / Intervention	Sh. Rajiv Mehta, Advocate for the Applicant	M/s. Saha Wood Centre, West Tripura	22.11.2002
2	435	Application for direction / Intervention	Sh. Rajiv Mehta, Advocate for the Applicant	M/s. Bhagbati Saw Mill, West Tripura	22.11.2002
3	475	Application for direction / Intervention	Sh. Rajiv Mehta, Advocate for the Applicant	Sh. Netai Chand Saha, Prop. of M/s. Gour Netai Saw Mill and others	22.11.2002
4	476	Application for direction / Intervention	Sh. Rajiv Mehta, Advocate for the Applicant	Sh. Gopal Chandra Banik, Prop. of M/s. Sri Ram Saw Mill, Tripura	22.11.2002
5	490	Application for direction / Intervention	Sh. Rajiv Mehta, Advocate for the Applicant	M/s. Raj Saw Mill, Agartala, Tripura	22.11.2002
6	765	Application for direction for quashing of the order dated 21.1.2002 passed the HPC in Appeal No. 77	Sh. P. K. Jain, Advocate for the Applicant	M/s. Sankar Saw Mill, Gauripur, Assam	22.11.2002
7	766	Application for direction for quashing of the order dated 21.1.02 passed by the HPC in Appeal No. 78	Sh. P. K. Jain, Advocate for the Applicant	M/s. Sunrise Saw Mill, Dhubri, Assam	22.11.2002
8	767	Application for direction for quashing of the order dated 12.2.2002 passed by the HPC in Appeal No. 38	Sh. P. K. Jain, Advocate for the Applicant	M/s. Laxmi Narayan Saw Mill, Bashbari, Assam	22.11.2002
9	768	Application for direction for quashing of the order dated 19.3.2002 passed by the HPC in Appeal No. 85	Sh. P. K. Jain, Advocate for the Applicant	M/s. Farida Saw Mill, Gauripur, Assam	22.11.2002

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10	769	Application for direction for quashing of the order dated 19.3.2002 passed by the HPC in Appeal No. 6	Sh. P. K. Jain, Advocate for the Applicant	M/s. Assam Saw Mill, Dhubri, Assam	22.11.2002
11	770	Application for direction for quashing of the order dated 19.3.02 passed by the HPC in Appeal No. 82	Sh. P. K. Jain, Advocate for the Applicant	M/s. Mahabir Saw Mill, Dhubri, Assam	22.11.2002

II. Applications filed before the Central Empowered Committee

S.No.	I. A. No.	Application for	Filed by	On behalf of	Date of Hearing
12	13	Cutting of trees grazing etc. in Rajasthan Ranthambhore Reserve	M. S. Kachhawa Advocate & Others	State of Rajasthan	22.11.2002
13	15	Regarding unauthorised and illegal sand mining in River Gola, Village Kichha, Distt. Udham Singh Nagar, Uttranchal	Sh. Rajiv Bahl, Advocate.	State of Uttranchal	22.11.2002
14	16	Illegal Mining in Gair - Mumkin Rada at Khasra No. 192 Vill - Mallana, Dist. Alwar, Rajasthan.	All Resident of Village Mallana, for (Sariska Forest Area), and Shri Ambuj Kishore for (Jammu Ramgadh Sanctuary)	State of Rajasthan	22.11.2002

12/11/02

(M.K. Jiwrajka)
Member Secretary

Distribution :

1 Learned Amicus Curaie & Senior Advocate of Supreme Court of India.
2 Shri P. K. Manohar, Advocate Supreme Court & the Petitioner.
3 Shri A.D.N. Rao, Advocate on Record for Ministry of Environment & Forests.
4 All Members CEC
5 Applicants / Respondents through their Advocates on Record.
6 Advocates on Record / Standing Counsel of the State Government(s).
7 Chief Secretary, Concerned States /UT
8 Principal Chief Conservator of Forests, Concerned States /UT
9 Secretary to Government of India, Ministry of Environment & Forests.
10 DIG (SU), Ministry of Environment & Forests.
11 Notice Board.

अरवरी क्षेत्र

जैव विविधता – नीति व कार्य योजना निर्माण

स्थानीय परामर्श समिति की बैठक का विवरण

अरवरी क्षेत्र की जैव विविधता की नीति एवं कार्ययोजना निमार्ण हेतु गठित स्थानीय परामर्श समिति (Local Advisory Committee – LAC) की प्रथम बैठक तरुण आश्रम, भीकमपुरा में 23 मई 2001 को आयोजित हुई। बैठक में भाग लेने वाले सदस्यों एवं विशेष आमंत्रित सदस्यों की सूची अनुच्छंद 1 में वर्णित है।

बैठक में विचारणीय मुद्दे :

1.1 सदस्यों द्वारा क्षेत्र का भ्रमण एवं खान प्रभावित क्षेत्रों का अवलोकन;

1.2 सदस्यों द्वारा समुदाय के साथ सीधा संवाद करना तथा जैव विविधता संबंधी मुद्दों एवं समस्याओं के समुदाय से जानना एवं समझना;

1.3 क्षेत्र की नीति एवं कार्य योजना निर्माण की दिशा में हुई प्रगति का प्रस्तुतीकरण;

1.4 अरवरी संसद की बैठकों में उभरे मुद्दों तथा क्षेत्र के अनुभवों पर चर्चा;

1.5 सदस्यों द्वारा कार्य योजना निर्माण हेतु सुझाव।

1.1. 23 मई को प्रातः 8.30 बजे से सदस्यों ने झिरी क्षेत्र में मार्बल माइनिंग क्षेत्र का अवलोकन किया। 9.00 बजे से कल्सी काला गॉव के लोगों से चर्चा की। यह गॉव mining क्षेत्र से घिरा हुआ है। इस गॉव में लगभग 60 परिवार हैं जो सभी मीणा जाति के हैं। इनका मुख्य व्यवसाय खेती एवं पशु–पालन है। गॉव में लगभग 150 बीघा सींचित तथा 200 बीघा असिंचित भूमि है। चरागाह की भूमि 250–300 बीघा है जो अब mining क्षेत्र में आने लगी है।

गॉव के लोगों से की गई चर्चा से उभरी बातें :–

- 50–60 वर्ष से गत 15 वर्ष तक यहॉ छोटे स्तर पर marble की खुदाई होती थी। यह खुदाई अलवर के एक ठेकेदार द्वारा करवाई जाती थी तथा marble मूर्ति बनाने के काम में लिया जाता था। इस खुदाई में छोटा पत्थर निकाला जाता था जिससे आस–पास के पर्यावरण तथा जीव–जन्तुओं को कोई खास नुकसान नही होता था। इस खुदाई के काम में स्थानीय लोगों को रोजगार मिलता था तथा स्थानीय मूर्तिकारों को पत्थर भी। यह छोटे स्तर पर खुदाई मुख्यतया कल्सी काला, साका का गुवाड़ा तथा पेड़याल्या गॉवों में होती थी।
- गत लगभग 15 वर्ष से बाहर के बड़े ठेकेदारों द्वारा व्यापक स्तर पर marble खुदाई हेतु सरकार द्वारा जमीनें आवंटित की जा रही हैं। इससे स्थानीय लोगों के जीवन पर अत्याधिक बुरा प्रभाव पड़ रहा है।

कल्सी काला गॉव के लोगों से हुई चर्चा से निम्नांकित तथ्य उभरे :–

- खानों में blasting के तेज धमाके होते हैं जिन से गॉव के मकानो में दरारें आती हैं। अवलोकनकर्ताओं को ग्रामीणों द्वारा तीन–चार मकानों में दरारें दिखाई भी गई।
- Blasting के दौरान पत्थर उछलकर ग्रामीणों के घरों और खेतों में गिरते हैं। इससे कई तरह की दुर्घटनाएँ होना आम बात हो गई है, जैसे – पत्थरों के लगने से मवेशियों का घायल होना या मर जाना। ग्रामीणों ने गत एक वर्ष में तीन–चार घटनाओं के बारे में बताया।
- खान मालिकों एवं ग्रामीणों के बीच लगभग रोजाना झगड़े होते हैं। दो–तीन मुकदमे भी इनके बीच चल रहे हैं। ये लोग ग्रामीणों के बींच फूट डालने का भी प्रयास करते हैं।
- बेकार पड़ी खानों में रात्रि के समय पशु गिर कर मर जाते हैं या कई दिन तक घायल होकर पड़े रहते हैं और उनकी दर्दनाक मौत होती है।
- खानें गहरी होने और खानों में जल के अत्याधिक उपयोग तथा भूमिगत जल का अत्याधिक दोहन के कारण गॉव के कुँओं का जल स्तर बहुत अधिक घट गया है, कुछ कुँए तो सूख गये हैं।
- खानों का मलबा गॉव के तालाब के आस–पास डाले जाने से जालाब का पानी प्रदूषित हो रहा है तथा तालाब में पानी आने के रास्ते भी बन्द हो रहे हैं।
- खानों में blasting करने के लिए उपयोग होने वाली बारूद तथा blasting से उड़ने वाली धूल से स्थानीय पर्यावरण में प्रदषण फैल रहा है; लोगों में दमा की बीमारी होने लगी है तथा फसलें खराब होने लगी हैं। धूल जमने से क्षेत्र में चारे की घास कम उगने लगी है और जो उगती है वह भी खाने योग्य नहीं होती है।
- तीन परिवारों ने परेशान होकर खान ठेकेदारों को अपनी जमीन को बेच दी है तथा मजदूरी करने हेतु अन्यत्र चले गये हैं।
- खान ठेकेदार कल्सी काला गॉव के लोगों को अपनी खानों में मजदूरी पर नहीं रखते और ग्रामीणों को मजबूर करते हैं कि वे परेशान होकर अपनी जमीनें उन्हें सस्ते दामों में बेच दें तथा कही अन्यत्र चले जाएं।

इन समस्याओं के सम्बन्ध में ग्रामीण कई बार सरकारी प्रशासन के पास भी पहुँचे लेकिन किसी ने भी इनकी समस्याओं को गम्भीरता से नहीं लिया। इसलिए वे लोग कष्ट भोग रहे हैं। अन्त में गॉव के लोगों से इन समस्याओं के समाधान के बारे में पूछा तो सभी ने दो सुझाव दिए जिनमें से कोई एक भी लागू हो जाए तो उन्हें समस्याओं से निजात मिल सकती है।

- गॉव के क्षेत्र से सभी खानों को बंद करवा दिया जाए या

- पूरे गॉव के कहीं दूसरे स्थान पर बसाने की व्यवस्था की जाए।

इस गॉव में चर्चा लगभग 1 या 1.5 घंटे चली।

1.2 उसके बाद सदस्य समुदाय के साथ आयोजित औपचारिक बैठक गॉव जगनाथपुरा के लिए प्रस्थान कर गए। बैठक प्रातः ठीक 10.15 बजे प्रारम्भ हो गई। सदस्यों के प्रारम्भिक संक्षिप्त परिचय के उपरान्त श्री कन्हैया लाल गुर्जर द्वारा बैठक के उद्देश्य बताए गए। इस बैठक में आस–पास के 7–8 गॉवों (हमीरपुर, समारा, झिरी, कल्सी काला, जगनाथपुरा, भांवता) से अरवरी संसद के सदस्य एवं अन्य ग्रामीण व्यक्तियों ने भाग लिया। कुल 70–80 ग्रामीण महिला तथा पुरुष थे। ग्रामीणों से सीधा संवाद करने हेतु LAC के वरिष्ठतम सदस्य श्री वी.डी. शर्मा तथा श्री तेजवीर सिंह ने कई तरह के सवाल उठाए तथा ग्रामीणों के उत्तर जाने। सबसे पहले चर्चा, क्षेत्र में उगाई जाने वाली फसलों, उनकी किस्मों एवं पैदावार के बारे में हुई।

- देशी गेहूँ तथा सफेद फार्मी अब कम उगाया जाता है, मुश्किल से 10 प्रतिशत लोग ही इसे उगाते हैं। कल्याण और गेहूँ 1482 की किस्म अधिक उगाई जाती है। देशी गेहूँ की ऊँचाई अधिक होती थी तथा चार बार पानी देने से हो जाता है जब कि नई किस्मों के गेहूँ की ऊँचाई कम होती है और पानी भी दुगना देना होता है। देशी गेहूँ का चारा अच्छा माना जाता है और इसके सूखे पुवाल को छप्पर बनाने के काम में भी लिया जाता था।

चर्चा में कल्याण सोना तथा सफेद फार्मी किस्मों में अन्तर बताए और उनको तालिकाबद्ध किया गया है।

कल्याण सोना	सफेद फार्मी
1. बाजार भाव लगभग रु. 600/– प्रति किवंटल	बजार भाव रु. 750/– प्रति किवंटल
2. अन्न पैदावार अधिक– एक बिसवा जमीन में दो मन लगभग 80 कि.ग्राम।	अन्न पैदावार कम– प्रति बिसवा जमीन में एक मन लगभग 40 कि.ग्राम । लेकिन चारा उत्पादन अधिक होता है। खपत (consumption) कम होती है।
3. इससे बनी रोटियॉ थोड़ी देर बाद ही कड़ी सख्त हो जाती हैं।	काफी देर तक रोटी ताजा व नरम बनी रहती हैं।
4. रासायनिक खाद/यूरिया का अधिक उपयोग किया जाता है। 1 बिसवा में 1 कि.ग्राम यूरिया।	देशी खाद का उपयोग किया जाता है। इससे अच्छी पैदावार होती है।
5. 2–3 वर्ष तक लगातार रासायनिक खाद के प्रयोग से जमीन सख्त होने लगती है। हर वर्ष रासायनिक खाद का उपयोग करना पड़ता है।	जमीन का उपजाऊपन देशी खाद के उपयोग से बना रहता है।

लोगों का मानना था कि सफेद फार्मी गेहूँ के बीज का संरक्षण करना बहुत जरूरी है अन्यथा बहुत जल्दी ही यह किस्म समाप्त हो जायेगी।

- जौ की पैदावार उन गॉवों में करते हैं जहॉ सिंचाई के लिए पानी की कमी है। इसेा पुराना बीज अर्थात देशी प्रचलित बीज ही बोया जाता है लेकिन कुछ लोग नई किस्म के बीज का उपयोग पिछले दो–तीन वर्प में करने लगे हैं। नई किस्म के जौ की पैदावार एक बिसवा में दो मन (80 कि.ग्रा) हो जाती है।
- मक्का का पुराना प्रच्चलित देशी बीज ही बोया जाता है।
- सरसों की तीन किस्में बोई जाती हैं। लेकिन गत कुछ वर्षों से इसको लोग कम बोने लगे हैं क्योंकि सर्दी के दिनों में इसकी फसल को पाला मार जाता है तथा चिपा लगने की बीमारी भी बहुत होने लगी है। इससे इसकी पैदावार घट गई है।
- चने की देशी किस्म तथा नई किस्म दोनों ही बोते हैं। यह कम पानी (सिंचाई) से भी हो जाता है।

इसी प्रकार चर्चा अन्य फसलों पर भी होती रही तथा इसी दिशा में पालतू पशुओं पर चर्चा चल पड़ी :

- पशुओं में देशी गाय तथा देशी भैंस अधिक पाली जाती हैं। हरियाणा की कुन्नी भैंसों की संख्या मात्र 10 प्रतिशत देखी जा सकती है।
- देशी गाय अधिकतम 4 कि.ग्राम दूध प्रतिदिन देती हैं लेकिन इसका बछड़ा बहुत उपयोगी माना जाता है और गोबर की अच्छी खाद। कुछ लोग जर्सी गाय भी रखने लगे हैं लेकिन इसके लिए लोग यहॉ का वातावरण उचित नहीं मानते हैं तथा इसके बछड़े को कोई काम का नहीं माना जाता है।
- क्षेत्र में सभी लोग बकरियॉ अवश्य रखते हैं। ये जंगल में चर कर अपना पेट भर लेती हैं तथा इन पर अलग से कोई खर्च नहीं करना पड़ता है। बकरी एक वर्ष में दो बार बच्चे पैदा करती है। एक वर्ष का बकरा 500–1000/– रुपये में बिकता है। बकरी का दूध परिवार में उपयोग कर लिया जाता है।

चर्चा में महत्वपूर्ण बात उभरी कि जब से जंगल कम हुए हैं तथा बकरियों को पर्याप्त मात्रा में चरने को नहीं मिलने लगा है तब से बकरी एक वर्ष में एक बार ही ब्याहती अर्थात बच्चे पैदा करती है तथा दूध की मात्रा भी कम पैदा कर पाती है।

जंगली जानवरों पर चर्चा के कुछ अंश इस प्रकार हैं :

- सरिस्का टाइगर रिजर्व पास में होने के कारण सुरक्षित क्षेत्र के जंगली जानवर कई बार खेतों में आ जाते हैं तथा नुकसान पहुँचाते हैं। सांभर, सूअर तथा रोजड़ा (नील गाय) फसलों को बहुत

नुकसान पहुँचाते हैं। नीलगायों की संख्या बढती ही जा रही है। इसकी आबादी पर वन विभाग को नियंत्रण करना चाहिए।

- गत 6–7 वर्ष से इस क्षेत्र में गिद्ध दिखाई ही नहीं देते हैं, पता नहीं कहाँ चले गए।
- गिदड़ पहले बकरियों तथा उनके बच्चों को खा जाते थे। अब नहीं खाते हैं तथा दोनों साथ–साथ विचरण करते हैं।
- नयाली/भेड़िया भी क्षेत्र में देखे जाते हैं जो कभी कभार बकरियों को मार कर खा जाते हैं।

वृक्षों के संरक्षण के लिए ग्रामीण समुदाय में कई प्रथाएँ प्रचलित हैं जिन में धराड़ी प्रथा प्रमुख है। इस प्रथा में जातियों के गौत्र के नाम से किसी पेड़ का नाम जुड़ा है जैसे – गुर्जर जाति में दोई गौत्र की धराड़ी बड़ को माना जाता है तथा तंवर गौत्र में केम के पेड़ को। ऐसा माना जाता है कि इन पेड़ों ने इनके गौत्र की रक्षा की थी। अतः इन गौत्र के लोग इन पेड़ों को नहीं काटते हैं और इनकी सुरक्षा भी करते हैं। लेकिन नई पीढ़ी में इस प्रथा की जानकारी कम होती जा रही है।

चर्चा में लोगों ने बताया कि धेंक, तेंदू, गुगल, खेरड़ी के पेड़, काला खेर इत्यादि वृक्ष क्षेत्र में बहुत कम हो गए हैं। ये अत्याधिक कटाई से कम हुए हैं। स्थानीय लोग पेड़ों के औषधीय उपयोग से भली भाँति परिचित हैं लेकिन नई पीढ़ी में इनकी जानकारी कम होती जा रही है। कुछ औषधीय पौधों पर चर्चा हुई।

- कड़ा (Holarrhina antidysentrica) का काढ़ा बाय/बदन दर्द में उपयोग किया जाता है। इस पेड़ के नीचे खाना ले जाने से कड़वा हो जाता है।
- सैंजना (Moringa oliefera) की फलियों की सब्जी बाय या बादी (indigestion) में उपयोगी मानी जाती है।
- हिरण खूरी (Tridax procumbens) का रस (Stem latex) चोट लगने पर खून रोकने तथा घाव भरने में उपयोगी माना जाता है।
- नीम के अनेक उपयोगों पर चर्चा हुई।

ग्रामीण समुदाय के लोगों से जब उनकी समस्याओं को लेकर चर्चा हुई तो प्रमुख समस्या मार्बल की खानों से होने वाले नुकसान को बताया। इन समस्याओं में अधिकतर वही समस्याएं उभरी जो कल्सी काला गॉव की चर्चा में सामने आई। इन समस्याओं से आस–पास के अन्य ग्रामीण भी पीड़ित बताए गए। कुछ लोगों के सुझाव थे कि

- खानों से निकलने वाले मलबे का उचित तरह से निस्त्रारण होना चाहिए।
- जो खानें बेकार हो गई हैं उनकी सही ढंग से भराईं होनी चाहिए ताकि दुर्घटनाएं नहीं हों।

- खानों में Blasting बंद होनी चाहिए।
- खातेदारी की जमीन में खानों के लिए पट्टे आवंटित नहीं किए जाए। खानों के लिए नए allotment नही किए जाएं।
- खानों में स्थानीय लोगों को रोजगार मिलना चाहिए।
- अत्याधिक पीड़ित गॉवों को अन्यत्र बसाने की व्यवस्था की जाए या उनके आस–पास से खानें बंद करवाई जाएं।

1.3 दोपहर भोजन के उपरान्त 2.00 बजे स्थानीय परामर्श समिति (LAC) की औपचारिक बैठक माननीय श्री वी.डी. शर्मा (सेवानिवृत PCCF, वन विभाग, राजस्थान सरकार) की अध्यक्षता में तरुण आश्रम, भीकमपुरा में प्रारम्भ हुई।

सदस्यों ने क्षेत्र भ्रमण के अनुभवों तथा ग्रामीण समुदाय के साथ सम्पन्न हुए संवाद के अनुभवों पर चर्चा की।

SAP निर्माण की दिशा में की गई प्रगति का विवरण डॉ. कुलहरि ने प्रस्तुत किया।

1.4 श्री कन्हैया लाल गुर्जर ने अरवरी संसद के सम्मेलनों के अनुभव प्रस्तुत किए तथा SAP निर्माण के लिए किए गए Field Survey के अनुभव भी बताए।

श्री कन्हैया लाल गुर्जर ने भांवता ग्राम सभा द्वारा वन संरक्षण के लिए बनाए गए 10 नियमों का उल्लेख करते हुए बताया कि किस प्रकार ग्रामीण समुदाय संगठित होकर इन नियमों का पालन करती है। इन नियमों के पालन से गॉव का वन पुनर्जीवित हो गया है तथा इस में जैव विविधता फल–फूल रही है। ग्रामीणों द्वारा पालना की जाने वाले प्रमुख नियम इस प्रकार हैं :

- जंगल में बकरी चराने वाला ग्वाला कुल्हाड़ी लेकर नहीं जाएगा।
- महिलाएं ईंधन की लकड़ी लाने के लिए कोई हथियार लेकर नहीं जाएंगीं।
- जंगल में शिकार करना सख्त मना है।

भॉवता के लोगों ने वन विभाग के साथ मिलकर दो सफल वृक्षारोपण (Plantations) गॉव में किए हैं।

1.5 श्री वीरेन्द्र शर्मा ने पड़ाक–छापली में गॉव की वन सुरक्षा समिति द्वारा वन संरक्षण के लिए किए गए कार्य के बारे में बताया। इस गॉव में ग्रामीण समुदाय के प्रयास से वन पुनर्जीवित (regenerate) हुआ है जो दूसरे गॉवों के लोगों के लिए एक उदाहरण बन गया है। श्री शर्मा ने कहा कि वन सुरक्षा समिति को वन विभाग का सहयोग ठीक से नहीं मिल रहा है। श्री तेजवीर सिंह निदेशक सरिस्का टाइगर प्रोजेक्ट का सुझाव था कि गॉव की वन सुरक्षा समिति का वन विभाग में पंजीकरण करवा लिया जाए ताकि वन विभाग की ओर से भी मदद मिल सके।

- पड़ाक–छापली में जिन लोगों ने वन संरक्षण के नियम तोड़े हैं उनसे अभी तक लगभग रु. 10,000 जुर्माने के रूप में वसूले जा चुके हैं।
- पड़ाक–छापली, चौसला, भॉवता तथा समरा गॉव में ग्रामीणों ने संगठित होकर अपने–अपने गॉव के वन संरक्षण हेतु नियम बनाए हैं तथा उन्हें सख्ती से लागू भी करते हैं। इन गॉवों में ग्वालों ने भी वन क्षेत्र में पेड़ लगाए हैं तथा उनकी सुरक्षा का भी जिम्मा लिए हुए हैं।
- श्री विरेन्द्र शर्मा ने बताया कि डुमोली गॉव के लोग अपनी देशी खाद को दूसरों को नहीं बेचते हैं तथा अपने खेतों में ही उपयोग करते हैं। ये लोग रासायनिक खाद का उपयोग नहीं करते हैं। इस बात पर सदस्यों ने चाहा कि इस गॉव का विस्तृत सर्वेक्षण एवं अध्ययन होना चाहिए तथा अनुभवों का लाभ SAP निर्माण प्रकिया में लेना चाहिए।
- श्री वी.डी. शर्मा साहब का सुझाव था कि सैंथल सागर का भी विस्तृत सर्वेक्षण होना चाहिए तथा जानना चाहिए कि सैंथल सागर में मछली पालन की क्या स्थिति है तथा उससे स्थानीय लोगों की जीविका को कैसे प्रभावित कर रही है। अतः तय किया गया कि डूमोली तथा सैंथल सागर का विस्तृत सर्वेक्षण श्री विरेन्द्र शर्मा तथा श्री कन्हैया लाल करेंगें। इनके सर्वे प्रपत्र श्री वी.डी. शर्मा उपलब्ध करवाएंगे।
- चर्चा में बात उठी कि कुछ किसान मानते हैं कि कुछ पेड़ों की वार्षिक छंगाई (coppicing) होनी चाहिए, इससे उनकी वृद्धि पर प्रतिकूल प्रभाव नहीं पड़ता है तथा ग्रामीणों के चारे तथा ईंधन की भी पूर्ति हो जाती है जैसे खेजड़ी, देश बबूल इत्यादि। सदस्यों ने भी अनुभव किया है कि कुछ समझदार किसान वैज्ञानिक ढ़ंग से coppicing करते हैं जिससे पेड़ की स्वस्थ बढ़ोतरी बनी रहती है। लेकिन वर्तमान पीढ़ी के लोग इसका ध्यान नहीं रखते हैं।
- श्री कन्हैया लाल जी ने बताया कि अरवरी संसद पुराने देशी बीजों के संरक्षण के कुछ नियम बना रही है जिससे अच्छी देशी किस्म लुप्त होने से बच सके। संसद के सदस्य मानते हैं कि जैव विविधता की दृष्टि से यह महत्वपूर्ण है।
- अन्त में सदस्यों का सुझाव था कि SAP की Interim progress report की प्रति सभी सदस्यों को उपलब्ध करवाई जाए ताकि सभी सदस्य SAP में निर्माण में अपनी सक्रिय भागीदारी रख सकें।
- सदस्यों ने तय किया कि LAC की अंगली बैठक 22 जुलाई 2001 को भीकमपुरा में आयोजित होगी। बैठक के अन्त में सभी सदस्यों ने SAP निर्माण की दिशा में किए गए कार्य पर संतोष जाहिर किया तथा आज के अनुभवों को सराहा।
- अध्यक्ष ने शाम 4.30 बजे बैठक का समापन किया।

(डॉ. ओम प्रकाश कुलहरि)

स्थानीय परामर्श समिति की प्रथम बैठक : 23 मई 2001

अरवरी क्षेत्र (अलवर) भीकमपुरा

जैव विविधता नीति एवं कार्य–योजना निर्माण

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2.	तेजवीर सिंह, [illegible] सरिस्का (निदेशक)	
3.	डा. सुधाकर मिश्रा, जयपुर	
4.	कांची कोहली, कल्पवृक्ष, नई दिल्ली	
5.	वीरेन्द्र सिंह रजावत, अध्यापक, पड़ाक छापली	
6.	कन्हैया लाल गुर्जर, गॉव– भॉवता, पोस्ट– आगर, थानागाजी [illegible], कार्यकर्ता TBS, भीकमपुरा	
7.	सुरेशचन्द्र रैकबार, तरुण भारत संघ भीकमपुरा– किशोरी, अलवर, राज0.	
8.	टी. जुमुल, NPIM, Room No. 318, CSMRS, N-Delhi	
9.	सतेन्द्र सिंह, तरुण भारत संघ	
10.	डा. ओमप्रकाश कुलहरि	