

Sanyukta Van Vyavasthapan Samiti, Baripada

Introduction

Sanyukta Van Vyavasthapan Samiti, Baripada (SVVSB) in Dhule district of Maharashtra has been working in Baripada village to restore the health of the reserved forests which lie in the Galana hills at the northern tip of the Western Ghats. Indiscriminate exploitation of forest resources caused rapid deforestation in the region in the decade of 1980-90 which led to near total destruction of the forests and scarcity of drinking water.

Deforestation made the living conditions tougher for the main stakeholders-the 108 households (population 757) belonging to Kokani and Bhil tribes in Baripada village- who depend on the forests for their daily lives and livelihood. Besides, drinking water they also faced scarcity of firewood, fodder and other non-timber forest products (NTFPs). Agriculture productivity declined, poverty and unemployment increased leading to large scale distress migration involving as much as 70 percent of the population. The other stakeholders in the regeneration efforts are the forest department of Dhule and a local NGO called Vanvasi Kalyan Ashram. SVVSB's conservation efforts could be classified under Co-management: Government-supported non-statutory community.

Starting with regeneration of forest cover and restoration of water table in the village, SVVSB's work later expanded to include health, education, watershed development, farming, renewable energy, self-employment, and empowerment of women. The conservation efforts spearheaded by Mr. Chaitram Pawar, an educated youth from the village received recognition from the International Fund for Agriculture Development (IFAD) in 2003.

Institutions and Processes

Creating a moral and institutional connection between the villagers and forest was a major challenge for any conservation effort. Alcoholism and apathy was rampant in the communities and proved to be a bottleneck. The turn-around happened in 1991 when a group of youths led by Mr. Pawar planted 3000 eucalyptus saplings in the village commons, using their own money. Initially other villagers ridiculed them but when they saw the plants growing well, ridicule turned to respect. People were now receptive to ideas on conservation.

After repeated meetings involving all the villagers in 1992, it was decided to protect 445 hectares of the forest owned by forest department, adjacent to Baripada. A Joint Forest Management Committee (JFMC) was formed the same year. The executive committee has 11 members including four women and is selected in Gramsabha every five years. Members represent each surname and each hamlet of the village. The committee canvassed the surrounding villages and declared their intent to protect the reserved forest. Each family in the village is represented in the SVVSB which acts as the general body and meets once in two months.

All decisions are taken in the SVVSB meetings where each member needs to be present. In an interesting method, the meeting gives the responsibility of implementing certain decisions to the person/people who are deemed as potential trouble makers. The decisions are recorded in the meeting register and are declared as SVVSB rules which are then communicated to surrounding villages by public announcement in weekly *haats*.

SVVSB has formulated several rules for protection of the forest and sustainable use of forest resources by the members. There are strict penalties for breaking the rules like a fine of Rs 1001 for timber hauled by bullock carts, Rs 1500 for cutting a green or living tree. Members are allowed to stock up on year's supply of firewood for 15 days in winter (only head loads). The rules also permit the villagers to carry dead firewood on special occasions of marriage, funeral and other social functions. Each family is required to contribute voluntary labour (*shramdan*) for all the conservation works with those who abstain from *shramdan* without justifiable reason being penalized Rs 50 per head per day. The general body meeting authorizes all money transactions and bank account is operated by three office bearers. The JFMC secretary keeps the record.

Two elderly people from the village are appointed as watchmen for the protected area. They are responsible of reporting any theft or rule breaking. Every family in the village contributes Rs 3 per month or grain equivalent to that amount towards the wages for the two watchmen. They each receive Rs. 100 per month and the remaining amount is used by SVVSB for social work.

Auction is used as the method for giving extraction rights on NTFPs. The previous year's price is used as the minimum and the auction is limited to the members of SVVSB only. Since all members belong to the scheduled tribe community, no caste based discrimination takes place.

(there is limited info on benefit sharing)

Biodiversity outcomes

In 2004, a biodiversity register was created, documenting plants in 40 different sites using 100 sq m quadrants. The exercise is repeated twice every three years. It registered 342 species of plants, natural forest vegetables, medicinal plants, fruits and flowers, Birds and Animals. Both floral and faunal biodiversity have improved since the conservation efforts. Creepers and grasses that had all but lost to grazing and fire have made a comeback. At least 25 – 35 percent of the plants have regenerated on their own. Certain species not seen earlier like *Caesalpinia crista*, *Acasia catechu*, *keli*, *godghot* and *yelangi* are also seen now. Endangered species like *Plumbago zelanica*, *Polyalthia longifolia*, *Curcuma oblonga*, *Gloriosa superba* have increased in number. There are around 48 species of birds of which at least 4-5 are new. Peacocks that were not seen earlier are now abundant. There are 20 different species of animals in forest including tigers (*Bibatya*) which are seen more frequently and stay for longer periods. The increase in the numbers of wild pigs has been remarkable. The ground water availability has increased up to 10 metres. The number of wells has increased to 42 from two. The availability of grass/ pasture has increased significantly. The construction of continuous contour trench (CCT) and farm leveling have prevented soil erosion.

Improved well-being

Agriculture productivity has improved on account of improved water availability and improved soil moisture. Villagers are growing a larger variety of crops than just paddy and black gram. Around 10-12 farmers are able to earn around Rs 15000 per year from vegetables like tomato, brinjal, and okra. Onion has become an important cash crop. Productivity of paddy, a staple crop in *Kharif* has increased 10 times since 1992 to 60 quintal per hectare while productivity of wheat, an irrigated *rabi* crop has increased by 50 percent to 17 quintals per hectare.

Notable changes in Baripada (1992-2011)

Issue	1992	2011
Chlorination of water	0	100 % in monsoon season
Alcoholism	90 %	10 %
Smoking	90 %	0 % from young generation
Vasectomy	4 %	50 %
Construction of latrines	0	14 Families
Change in Food habits	Roti, Dal, Rice & occasionally green vegetables	In addition Non-veg food, ghee & oil

Villagers have setup small businesses which were non-existent in 1992. Around 40 families are engaged in jaggery production. Mahua flower sale netted around Rs 200,000 for the villagers. People have started bee farming and collection of lac (resin) from trees. The increased fodder production has brought about tremendous change milk production with Rs 200,000 worth of milk sold by the villagers in 2007. The agricultural produce and the NTFPs are marketed collectively in local market which helps the producers earn better price. SVVSB has not yet encouraged organized eco-tourism but at least 50 visitors per week come to Baripada providing income earning opportunity to villagers.

Improved incomes is also reflected in the increase in the number of material assets like vehicles, gadgets like music players and television. Migration has reduced to 20 percent. Food habits have changed with higher consumption of green vegetables, pulses, animal proteins and ghee. Attempts are being made to generate electricity from bio-gas using mahua de-oiled cakes. Construction and use of latrines has increased. Incidence of malnourishment in children has reduced significantly. Between 1992 and 2007 there has been a significant rise in the number of people seeking treatment from qualified doctors.

Tanda Panchayat

Introduction

Since the turn of this century, Wadala village in Akola district of the state of Maharashtra has been the place of a biodiversity conservation effort that has active participation of a traditional hunting community which- a rarity in India. The project led by Samvedna, an NGO, is a combination of **biodiversity conservation** and **building livelihoods**.

The area is home to Fase pardhi community, a sub-sect of the Pardhis. Pardhi tribes, who have traditionally been hunters, were notified as 'criminal tribes' during the British period. Though de-notified in 1952 in Independent India, the tribe continues to face the social stigma even today. The tribe followed sustainable methods of hunting sanctioned by their '*jati panchayat*' (caste council) but drastic decline in wildlife populations caused by several external factors adversely affected the tribes' livelihood. Enactment of the Wildlife Protection Act in 1972 dealt a further blow to the community by making their livelihood wholly illegal. Without recourse to any alternative livelihood and neglected by all development plans, the community exists at the margins and often succumbs to the lure of organized poaching gangs.

The conservation efforts are resulting in visible changes in the community, ecosystem and the wildlife, particularly the lesser florican, an endangered bird species listed in the schedule I of the Wildlife Protection Act. Himmat Pawar from the community has given up hunting and drinking and is leading the campaign to convince his community to completely give up hunting and take up alternative livelihood; a daunting task still. Samvedna initiated the 'Conservation of lesser florican and livelihood development of Fase pardhi tribe in central India' in 2008 funded by United Nations Development Programme (UNDP) and Ministry of Environment and Forest (MoEF). Coordinated through the Centre of Environment Education (CEE), Ahmedabad, the Project conserves 100 ha of village forests that were open to uncontrolled grazing and the habitat of lesser florican across an area of 900 square kilometers. The Fase pardhi community is the main stakeholder. Members of pastoral tribes have also benefited from the grassland conservation.

Grasslands punctuated with thorny tropical bushes of Acacia species and covered by grasses like Kunda (*Ischaemum pilosum*) dominated the area which is home to animals like Black buck (*Antelope cervicapra*), Indian wolf (*Canis lupus pallipes*) Blue Bull (*Boselaphus tragocamelus*), and birds like highly endangered lesser florican (*Sypheotides indicus*).

Institutions and processes

The conservation efforts involve around 500 families and 2500 individuals from the Pardhi tribe. It all began in 1998 when Mr. Kaustubh Pandharipande came to this area for his research on the rare birds of the region and was helped by the Fase pardhis. Sensing a need, he set up Samvedna in 2001. The NGO explained to the tribe that instead of hunting if they apply their skills to protecting the lesser florican then the stigma of poachers and criminals could perhaps be erased. They started with preparation of People's Biodiversity Register (PBR), in 2001 in coordination with Centre for Ecological Sciences (CES) of Indian Institute of Science (IISc) Bengaluru. On the suggestion of the Pardhi youths, the 'Tanda Panchayat' (TP) was set up as an improvement over their traditional '*jati panchayat*' to act as the central decision making body. Like the 'Gramsabha'¹, all adult members of the village (850) are members of the TP and unlike the *jati panchayat*, the head of the TP is not decided by birth and more women participate in the TP. The general body selects around 10 executive members who can be changed any time if required. A joint forest management committee

¹ Under the decentralized local self-governance system, the Gramsabha is the general body of the village consisting of all adults as members

(JFMC) and a bio-diversity management committee (BMC) have also been formed in the TP. The BMC will be responsible for the next PBR which will document the changes in biodiversity in the intervening years. Participation by all is a must in the meetings of TP. Rules are unwritten but known to all the members, decisions are taken mostly by consensus, and members use the non-discriminative traditional rules of conflict resolution followed in the *jati panchayat*.

When a family applies to the TP for certain area of land for conservation it considers land availability, number of family members, number of animals and the family's past history in conservation while allotting the land. The family then takes full responsibility for the allotted area and in return is entitled to the produce from the area. Transparency is ensured as decisions are taken in public. Samvedana, youth group members as well as other TP members monitor the conservation activities.

Besides PBR, other conservation activities include participatory field surveys and camping to identify the breeding and nesting sites of the lesser florican, conservation of local variety of grasses in 100 ha of forest land. The livelihood development activities include promotion of savings and credit and assistance for goat rearing through self-help groups; implementation of schemes by tribal development department, implementation of Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA); and fodder development.

Biodiversity outcome

The number of traditional endemic grass species has increased as has the quantum of grass produced. More than 141,000 Kgs of grass worth around Rs 217,000 has been produced, benefiting around 68 families. This has also helped in development of goatery as an alternative livelihood option. Hunting has reduced by 20 percent and till 2011 there have been 97 sightings of the lesser florican including 70 females. No major positive changes in ecosystem services have been documented in the 100 ha area as conservation efforts are still in the initial stages. However, the increased grass cover is expected to check soil erosion, improve soil fertility and nutrient availability.

Improved well-being

More than 18 SHGS in the village have helped generate savings of around Rs 450,000 and have helped members avail credit to the tune of Rs 750,000. Goat rearing- an activity chosen by the community as an alternative to hunting- has increased in recent years due to improved availability of foliage and fodder, linking the conservation of grasslands strongly to livelihood improvement. The grassland near village Sisa Masa is attracting birdwatchers as the population of lesser florican increases. This could provide a tourism based livelihood option to the tribes.

Sustainability and replicability

The conservation efforts continue to be carried on by the tribe in Wadala even after withdrawal of the initial support from Samvedna indicating sustainability. Further, Samvedana's plans to expand the work to cover four districts, 50 villages and 1000 Pardhi families has received encouraging response from the communities in these areas, increasing the chances of replicability. A livelihood development scheme for traditional hunters based on the outcomes of this project was incorporated in the 11th five year plan. This provides a much needed and long awaited mechanism for development of the marginalized and stigmatized communities like the Pardhis.

Shankarpur Gram Panchayat

Introduction

In 2012, 32 applicants from Shankarpur village in Gadchiroli district of Maharashtra got Community Forest Rights (CFR) titles to 598 hectares (ha) of land under the Forests Rights Act, 2006 making it one of the first few villages in the state to get these rights. The Gram Panchayat (GP) of Shankarpur, of which Shankarpur village is a part, has been active in conservation activities with the objective of ensuring local livelihoods while protecting biological diversity.

The people of Shankarpur depend on the surrounding dry deciduous forest for food and fuel. The conservation efforts were sparked off in 2003 by a fear on account of water stress that year. To conserve water, the villagers decided not to pump water from underground aquifers but use only the available surface water. The major challenge that the community faces is to balance the need for biodiversity conservation with their own needs. From 2004 to 2007 the GP undertook Joint Forest Management (JFM) projects with the state forest department to rejuvenate their depleting forests and is now using that experience to design an integrated system of management that it expects will enable its 200 households to achieve the required balance. The GP had made a management plan for the village in 2005 to leverage and equitably distribute benefits from various government schemes. The villagers had claimed rights over 990 ha of land and have presently received titles over 598 ha.

The village population of 1100 has practitioners of four religions viz Hinduisim, Islam, Buddhism and Neeramkari. There are 22 sub-castes including Brahmins, Vaishyas, Marathas and Dalits. There are several Scheduled Tribes (ST), Nomadic Tribes (NT) and Other Backward Classes (OBCs). The key stakeholders are the people of Shankarpur village, particularly the members of the Forest Rights Committee (FRC); the holders of the CFR titles.

Institutions and Processes

The village has a *gram sabha*¹ (village council) with all adults of the village as its members. In addition there are specific committees for specific tasks. For instance the JFM committee was established for managing the JFM projects and in 2009, the village constituted a Biodiversity Management Committee under the Biodiversity Act (BDA), 2002 for conserving biodiversity.

The BMC membership norms have been framed in a manner that each family of the village sends one man and one woman to the meetings. To ensure effectiveness, the village has been divided into three sections with a sub-committee of 15 members for each section. From these, 15 members are chosen into the BMC representing all four religions, marginalized castes as well as women who constitute 33 percent of the membership. The chosen members were those who had attended study group sessions in the nearby village of Mendha Lekha. The villagers of Shankarpur attribute the success in conservation to their new rules that; prohibit hunting (except for rabbit during part of the year for self-consumption), ban cutting and sale of timber, restrict grazing in forest areas, ban setting fire in the forests, and promote plantation drives.

All adult members of the village are free to attend and voice their opinion in all the meetings, for their area or the gram sabha and people are also free to seek any information from their section sub-committee or the *gram sabha*. The BMC in Shankarpur was formed after interactions and study group sessions with Mendha Lekha village which made the villagers of Shankarpur aware of the

¹ The *gram sabha* is the basic unit of local self-governance in India and acts as the general body of the village.

various relevant laws and policies related to conservation and forest management. As they became aware of the FRC Forest Rights Act (FRA), 2006, the villagers formed the FRC as well in 2009. The meetings of the *gram sabha* are recorded in writing. **the institutions for the FRC and BMC are still under construction.** Monitoring of the conservation activities is done by the villagers voluntarily while there is a system of social audit by the *gram sabha* for the works done under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), 2005 which is a major source of funding in the village.

In an interesting strategy the *gram sabha* has used the BDA as a tool to map the biodiversity of the area and plan for management, along with the FRA for ensuring the rights over resources through CFR, and finally the MGNREGA to gain, both funding infrastructure needed in the village and wage employment for the residents.

Biodiversity outcomes

The decade long conservation activities of the *gram sabha* in Shankarpur GP along with the JFMC, BMC and the FRC have resulted in visible changes in the surrounding forests. Though exact figures are not available for floral and faunal changes as the biodiversity register is still under preparation, villagers report that the foliage is much denser, trees are larger and the quality of forest produce better than what was visible and available in the past 30 years. Several large mammals like the civet cats, leopards and animals like *barasingha*, *sambhar*, *chital* (spotted deer), *neelgai*, bears, wild boars, wild dogs and various monkeys that were either missing for decades or had reduced in numbers are once again been seen. Due to the improvements in water table and health of the forests, villagers report significant reduction in the time spent to fetch water and collect non-timber forest produce (NTFP). Though temperatures have not been recorded, the villagers say that there is a substantial difference in temperature between their village with its improved forest cover and villages nearby that did not take up conservation activities.

Improved well being

Improved quality and availability of NTFPs like *gum* and *mahua* flowers (*Madhuca indica*) are yielding better incomes from their sale. MGNREGA has helped generate wage employment as well as development of animal husbandry. Plantation drives and building of around 300 check dams of various capacities to conserve the soil and water have also generated wage employment and longer-term benefits. Migration to cities has now reduced significantly as people are finding gainful opportunities within the village. Eco-tourism has started in the form of guided tours to nearby fort called '*Mahadev Gadh*', visited by 600-700 tourists annually, and offering the villagers earning opportunities as cooks, helpers and guides.

Sustainability and replicability

The development plans of the village are rooted in a deep sense of responsibility towards the local ecology. The livelihood improvements have been due both, to the empowerment of the people who had themselves planned and implemented the conservation efforts, giving them the confidence to leverage benefits from government schemes, as well as to the improved ecology resulting in better availability of resources. The *gram sabha* has been able to link conservation schemes like JFM and BDA with rights and entitlements under FRA and MGNREGA while ensuring participation of and benefits to all the communities in the village, especially marginalised ones. The *gram sabha* has currently received Rs 10, 00,000 for animal husbandry in the village. The work undertaken in Shankarpur is itself a replication the work in Mendha Lekha can be replicated in other parts of India provided there is a will to keep the process open, representative and accountable.

Ajeevali Panchayat

Introduction

Protecting patches of forests termed as 'sacred groves' and dedicated to deities or ancestral spirits is one among different forms of nature worship in India and many parts of the world (Malhotra *et al.*, 2001). They represent traditional ecological knowledge of balancing between use and sacrifice of natural resources. One such sacred grove known as 'Ajeevali' lies between the urban centres of Pune and Mumbai in the northern periphery of the Western Ghats - one of the 34 global biodiversity hotspots (Myers *et al.*, 2000). Located in Maval taluk of Pune district and covering an area of 12 hectares (ha), this tropical evergreen grove is protected and conserved in the name of tiger goddess, 'Waghjai Devi'.

The biodiversity conservation efforts of the people of Ajeevali-Javan panchayat are underpinned by the need for protecting their cultural and religious values. The grove serves as a wild life corridor besides acting as refuge for endangered endemics like *Ratufa indica elphinstonii* (Indian Giant Squirrel). According to Kanade and Goturkar (2005) around 250 plant species have been recorded from the sacred grove and surrounding catchment, of which 194 species were recorded earlier (Godbole, 1993).

The Maratha community, primarily agriculturalists, constitutes more than 80 percent of the village population and takes active part in the management of the grove. The other major communities are; the *Thakars*- a tribal community originally hailing from Konkan and involved in extraction of *Maadi*¹; Mahadeo *Koli*, another tribal community involved in priestly activities. *Sutar*, *Chambhar* and *Harijan* (balutedars) communities form the remaining segment of the population.

The key stakeholder in the conservation is the temple trust. The other stakeholders are the villagers including contractor, the Gram Panchayat (GP), the Thakars who extract 'Maadi' and other NTFPs, 'Maadi' purchasers from nearby villages and even from cities like Pune and Mumbai who visit the grove to drink 'Maadi'.

Institutions and Processes

Management of Ajeevali sacred grove is an example of democracy and local community participation. The management structure comprises of the temple trust, the village governing council (Gram panchayat-GP²) and the '*maadi*' extractors. The GP comprises of 11 elected representatives and is the constitutional decision making body in the village but given the associated religious beliefs, the temple trust has the administrative authority for the management of the grove. The trust has representation from all communities based on their initiative and interest. Activities like hunting, grazing, extraction of timber and Non Timber Forest Produce (NTFP) other than *maadi* has historically been prevented by religious beliefs.

The extraction of *maadi* is done under a contract system where each year on the day of 'Ganesh Chaturthi' (August / September) and in the presence of all the villagers, the trust auctions the right to extract *maadi* from the grove, necessarily to a local person. The contractor hires the *thakar*' community from the villages in the Konkan region (Pali, Raigad), having the necessary skills, to extract *maadi*. In 2010, the auction fetched the trust Rs 526,000, an increase of 150 times over Rs 3,500 that it received in 1985. The proceeds are generally used for activities like temple

¹ Traditional local liquor prepared by fermenting phloem sap of *Caryota urens* – fish tail palm

² Village Panchayat or Gram Panchayat is the constitutionally elected body at the village level under the three-tier decentralized self-governance system

construction, grove maintenance, and community festivals as decided in open meetings with the villagers. During the contract period, the *maadi* contractor is expected to protect the grove from destructive means (illegal/unauthorized natural resource collection, encroachment, forest fire etc).

The grove management system functions efficiently and effectively relying entirely on unwritten strict code of conduct and various norms of behaviour that prohibit removal of any plant material including dead wood and leaf litter from the grove. The villagers collectively decide the punishment for anyone breaching the code. While locally generated economic incentives have helped conservation, it is unclear if incentives provided by government could have been useful and how those could have been distributed to stakeholders. Distribution of costs and benefits across stakeholders is also unclear. These issues are now under study for developing management strategies for the future.

Biodiversity Outcomes

About 40 years ago a local school teacher and a few villagers saved Ajeevali by stopping some of the villagers from selling the grove to a coal merchant. Unlike the protected sacred grove that mostly has evergreen species; the 'high disturbance' surrounding sites are in a degraded state and have largely deciduous species. The grove has globally endangered and endemic medicinal plant species like *Nothapodytes nimmoniana* (Wight) Sleumer, well-known for its anti-cancer and anti-HIV properties when clandestine trade has reduced the population of this species by 50-80 percent during last decade from other parts of Western Ghats (CAMP, 2001). Eight such medicinal species including *Gloriosa superba* (Kalalavi) and *Rubia cordifolia* (Manjistha) that belong to IUCN threat category (CAMP, 2001) have been recorded in Ajeevali. About 75 percent of the total recorded plant species in the grove have utility value (timber, food, fuelwood, fodder, medicinal, edible and religious). The dominant species in the grove is *Caryota urens* commercially used for extraction of *maadi*.

Besides the Indian giant squirrel, several other mammals such as barking deer, palm civet and porcupine are found in the grove owing to its undisturbed nature and dense canopy cover. The cave of the Waghjai deity supports bat population. Villagers report sporadic sightings of large mammals like leopards and frequent sightings of birds like the White checked barbet, White bellied drongo, Paradise fly catcher, Malabar whistling thrush (endemic to Western Ghats). Several bees, flies and butterflies visit under-storey plants like *Strobilanthus callosus*, *Thelepaepale ixiocephala*, *Leea indica*, indicating high diversity of pollinators. The area is also rich in amphibian and reptilian diversity with bamboo pit viper, vine snake, bronzeback, checkered keel back and different species of frogs and toads (*Rana tigrina*, fungoid frog, common tree frog) being recorded in the area. Several frugivorous species of birds like hornbills, barbets can be seen feeding on keystone species like *Ficus* in and around the grove. The forest floor is rich in biomass and provides habitat for invertebrate species like insects, centipedes and beetles and supports growth of many tall trees. During peak summer when the outer area experiences temperature as high as 43°C, the temperature in the grove is around 30-35°C.

The dense forest and undergrowth in the grove check velocity of rain water enabling ground water recharge. This provides water for irrigation to the village which does not have any other irrigation facility. A study in 2005 conducted with inputs from the local people, noticed that the people were giving selective protection to *C. urens* due to its economic value. The resultant increase in its population density has reportedly reduced the quantum of *maadi* as the new plants have smaller girths. This issue is planned to be studied systematically in the future in addition to regular monitoring of the overall biodiversity and assessment of ecosystem services and with involvement of local people.

Improved well-being

The sacred grove contributes to the well-being of the local people in many ways. Medicinal plants from the grove serve primary health care needs while about 50 species of 'Wild Edible Plants/Uncultivated Foods' like *Dioscorea pentaphylla*, *Vigna vexillata* serve as supplementary diet, primarily in the rainy season. *Maadi* is a major source of revenue for the village. Besides the auction proceeds and employment for extractors, villagers also sell *maadi* to people coming from the cities. Local community also collects 'wild banana' (*Ensete superbum*) and *C. urens* leaves from the grove and its surroundings for sale in the city of Pune. *C. urens* leaves are used in bouquets while banana leaves are used in ceremonies and religious festivals. Out of ignorance about its endangered status, the temple trust once sold a truckload of *N. nimmoniana*, which yields camptothecin, an anti-tumor alkaloid, to a merchant for Rs 50,000. While there are no organized tourism activities yet, some local people have started providing shelter, food and guided tours for the weekend tourists. With proper planning and better amenities, sustainable eco-tourism can be a potential livelihood option for the villagers. Several biology students from colleges visit the area for their curricular field visits, where local people act as resource persons. Agriculture remains the main occupation of the villagers which has also benefited from the grove protection. This model of accruing economic benefits through biodiversity needs replication elsewhere for better environmental protection.

Sustainability and Replicability

There are several conservation efforts like Ajeevali across the Western Ghats with varying social, institutional and ecological contexts. Until recently there was no legal or policy framework in India to support the conservation efforts such as Ajeevali. The Government reserved forests as well as protected areas (PA) network does include some sacred groves but the management of such groves does not take into account the traditional relationship of the local people with these groves, often leading to conflicts. In recent times there has been an increasing recognition of local people's role in biodiversity conservation and of the fact that people do have their own systems of conservation. The Biological Diversity Act (2002) has provisions for declaration of "heritage sites" which could be a space for conservation of such groves. In addition, the Wildlife Protection Amendment Act 2003 has included two new categories of PAs, namely, conservation reserves and community reserves. In areas where it is difficult to declare PAs due to land/resource rights related conflicts with the local people, encouraging people's own systems of conservation can be a way ahead for biodiversity conservation. However, this will require careful analysis of conservation and reward tradeoffs for both the local people and government agencies. The success of Ajeevali that employs the model of attaching economic benefits to conservation could become replicable in similar areas across the Western Ghats.

Parambikulam Tiger Reserve

Introduction

The Parambikulam Tiger Reserve (PTR) located in the Western Ghats region of Anamalai – Nelliampathy in Palakkad district of Kerala is witnessing successful integration of the seemingly opposite ends of livelihood development of the local tribal people and biodiversity conservation. Backed by innovative management practices, the management of the reserve has successfully co-opted the local community to create a win-win situation for both. Declared as wildlife sanctuary in 1985 (285 Sq.Km) and later as a Tiger Reserve in 2009 (643.66 Sq.Km), the reserve has 1254 people from 276 families belonging to four indigenous tribal communities living in six settlements inside it.

Since 2006, the management and the local community together have successfully dealt with issues like sandal wood smuggling and poaching, over-grazing, forest fire, plastic garbage, and unsustainable extraction of Non-timber forest produce (NTFPs). The Eco-Development Committees (EDC), the Parambikulam Forest Development Agency (FDA) and field staff are the main stake holders in these efforts. The ecosystem comprises of evergreen, deciduous, mixed deciduous forests and teak plantations with rich floral and faunal diversity. Shola¹ forests, montane grasslands and marshy grasslands (*vayals*) are unique habitats of this region. Ongoing inventory studies have identified 1320 species of flowering plants including 70 species of Orchids in the reserve, 26 percent of these are endemic to Western Ghats. Among the 145 species in need of conservation, 85 are endemic species.

Institutions and Processes

Since 1988 the reserve is managed based on ten-year plans with two such plans completed so far. The first Tiger Conservation Plan (2012-2022) with inputs from more than 65 research studies conducted in the reserve is with the National Tiger Conservation Authority (NTCA) for approval. The nine EDCs offer an effective medium for the community to take part in the eco-development activities and benefit from the livelihood initiatives.

Protection of the reserve receives utmost priority and involves the community. They are an integral part of the 25 anti-poaching camps located on illegal entry points. Each camp comprises of two staff and three anti-poaching watchers from the community and is well-equipped with camera traps, walkie-talkies and GPS besides guns, vehicles and speed boats for the department staff. The Deputy Director of PTR directly monitors the special patrols in the monsoon. Information exchange at section, range, division and inter-state levels is critical and also involves the community through the six *Vana Jagratha Samitis* (VJS) at the range and division levels. The VJS receives information from the field level patrols and relays it to Range officers and the Deputy Director. Round the clock communication is enabled through walkie-talkies, 19 fixed wireless stations and 68 free closed user group (CUG) mobile phones. The frontline staff and members of the 'Social tiger protection force' (anti-poaching watchers) are given field kit and ration. The teams regularly track local village markets in the peripheral areas for transactions in wildlife. All the 700 odd cattle have been removed from the reserve with the co-operation of the community and in lieu of alternate livelihood sources. No private vehicles are allowed beyond the entry gate of the reserve and tourists are taken inside the park by the FDA owned safari vehicles accompanied by a trained guide from the community.

Biodiversity Outcomes

All poaching activities have stopped since 2004 and no incidences of fire have taken place since 2006; underscoring the importance of the community based management approach. Local people

¹ **Sholas** are patches of stunted evergreen tropical and sub-tropical moist broadleaf forests found in valleys amid rolling grassland in the higher montane regions of South India.

are using the NTFPs more sustainably and in more rewarding ways. Absence of cattle and removal of invasive species have led to improved forest regeneration and diversity of flora. *Haplothysmia exannulata*, thought to be extinct from the reserve has been recorded again. Likewise *Colubrina travancorica*, a climber, recorded in the last century has been rediscovered. The presence of about 20 tigers signifies the health of the ecosystem in the reserve. The reserve also supports one of the highest densities of *Gaur* population in Southern India besides hosting the only South Indian wild goat, the Nilgiri Tahr. Asian elephant, spotted deer, *Sambar*² (*Rusa unicolor*) and barking deer (Muntjac) and a healthy population of the Lion-tailed macaques are found in the reserve. Presence of around 273 species of resident and migratory birds makes the reserve a bird watchers paradise.

Improved well-being

Post the Supreme Court directive, the stoppage of operations in the 85 Sq. Km teak plantation in the reserve had adversely affected the livelihoods of the local communities who turned to activities inimical to the forests. The trend has reversed since 2006 with 234 of the 276 families employed in various protection (116) and eco-development activities (118). With an average 48,000 people visiting PTR, eco-tourism is a major source of revenue employing 71 EDC members. Certain innovations have generated employment while keeping the reserve plastic free, namely the 'Parambikulam Dhara', where EDC members operate a solar-powered reverse osmosis drinking water plant to purify and sell the natural spring water to visitors in tin cans; the 'Parambikulam Paper Bags' sold as an alternative to the banned plastic carry bags; 'Pugmark Keychain' souvenirs created from the plastic collected, segregated and shredded at Paramabikulam sell for Rs 20 apiece at the eco-shops. Only one of the six settlements is engaged in agriculture. The farmers there now earn up to 16 percent premium for their produce, sold at FDA outlets, due to organic certification facilitated by the park management. Value addition and sale of NTFPs like forest honey, bees wax balm, bamboo and reed products through eco-shops give 40-60 percent more incomes to the local people than before. Around four tons of packaged 'Parambikulam Honey' is sold annually and almost 80 percent of the profit from the handicraft unit is shared with the people.

Besides supporting economic activities, the FDA taps other government programmes to improve the quality of life for the local people like provision of drinking water, construction of houses, elephant proof trenches and pathways for settlements, renovation of Ayurveda Hospital, and renovation of a tribal school and provision of a teacher. The FDA is helping construct a Pre-metric Hostel for the tribal School with support of Rs. 7.2 million from the Tribal Development Department besides providing scholarships of Rs 74,000 (2011-12) to 18 students for pursuing college education. As a field NGO for the National Rural Health Mission (NRHM), the FDA conducts regular medical camps and awareness programmes. It provides an incentive of Rs 5,000 to pregnant tribal women to encourage institution delivery. For the year 2011-12, eco-tourism activities generated revenues of Rs 21 million, of which 40 percent each was used to pay wages and for maintenance of the reserve while remaining 20 percent went to community development programmes. The community now fully supports protection activities and no cases of violation of rules and regulations have been found against them since 2006.

Sustainability and Replicability

Managers, staff and EDC members from other protected areas within and outside Kerala visit the Parambikulam Tiger Reserve for gaining first hand insight into its the management practices. The management of the tiger reserve has consistently improved its performance of the years. For instance, the Management Effectiveness Evaluation (MEE) by an independent authority under NTCA rated Parambikulam as 'Good' in 2009-10 and 'Very Good' in 2010-11. The best recognition for the reserve came recently when it was awarded NTCA award for Excellence for the year 2010-11 for

² A large brown deer native to South and South-East Asia

'Innovative Practices'. These awards signify the relevance of the approaches adopted in the Parambikulam Tiger Reserve which are based on the concept of Joint Forest Management (JFM).

Periyar Tiger Reserve

Periyar Tiger Reserve (PTR), Thekkady, Kerala is considered a model for management of protected areas (PA) in the country, particularly synchronising the objectives of resource conservation and welfare of local communities. Besides academic recognition¹, the 'Periyar model of conservation', has influenced an amendment to the country's Wildlife Protection Act (WPA), 1972 in 2006. Considered as one of the best managed Tiger Reserves in India, PTR has a few 'firsts' to its credit notably technology aided monitoring of tigers, establishment of a foundation for managing the twin objectives of conservation and community development and most popular- converting poachers into protectors. This model was developed and evolved under the 'India Eco-development Project' funded by Global Environment Facility (GEF) and the World Bank (1996-2004). The Government of India (GOI) declared the erstwhile Periyar Wildlife Sanctuary as the Periyar Tiger Reserve in 1978.

Spanning three districts² of Kerala the tiger reserve is spread across 925 Sq.Km, of which 881 Sq.Km is the core area where no human activities are allowed. All activities like tourism and pilgrimage³ are limited to 10 Sq. Km each within the remaining 44 Sq.Km. The reserve has no human settlements inside but has tribal communities living on its periphery. The reserve has overcome the challenges of poaching and smuggling of woods, unsustainable extraction of Non-timber forest produce (NTFP), managing high influx of pilgrims and tourists, forest fires through a combination of strict enforcement and protection, scientific planning, people's participation in protection, livelihood development. With the improved status of the reserve the number of stakeholders interested in its well-being has also increased and include the Gram Panchayats, Eco-development committees (EDC), Periyar Foundation, Kerala Tourism Development Corporation, tour operators, service providers, Hoteliers and even Tamil Nadu Electricity board and Public works department.

Institutions and Processes

At the end of the India Eco-development Project in 2004, the authorities formed the Periyar Foundation to generate resources for and sustain the eco-development initiatives and the community based approaches for conservation of the tiger and biodiversity. Having such a foundation has now become a requirement for all the tiger reserves in the country under the amended WPA, 1972. The PTR is unique in forming different types of EDCs beginning in 1997. Today there are 76 EDCs under four categories *viz.* Neighbourhood EDCs, User group EDCs, Professional group EDCs and Pilgrimage based EDCs covering 5400 families and about 40,000 people. For best utilization of the skill-sets of the ex-poachers and illegal extractors of forest products in the protection efforts and help them derive best benefits in return, the PTR pioneered formation of different EDCs based on the previous activities of the 'ex-offenders'. For instance, there are EDCs of ex-cinnamon (*vayana*) bark collectors (EVBC-EDC), ex-poachers (Vidiyal EDC), ex-black Dammar collectors and Firewood and Thatching Grass Collectors EDC. In yet another unique attempt the Periyar foundation convinced the forest fringe community from Tamil Nadu (TN) to give up poaching of wildlife and smuggling of trees in the PTR, and form the Vidiyal EDC. This was necessary to completely protect the PTR as it is situated along the border of Kerala and TN.

¹ Food and Agriculture Organization (FAO) recognized the 'Periyar Model' as an exemplary forest management practice in the world in 2004 (<http://www.fao.org/docrep/007/ae542e/ae542e00.htm>)

² Idukki, Kottayam and Pathanamthitta

³ The famous temple of Lord Ayyappa in Sabarimala is situated in the buffer zone

The Periyar Foundation plays multiple roles in the management of PTR. The professional and scientific teams of the foundation, help the PTR management carry out periodic assessment of biodiversity for core and buffer zones, provide inputs to scientific research, creation and analyses of wildlife databases. A trained Tiger Monitoring Team (TMT) with tribal youths regularly collects evidence of tiger, co-predators and prey through patrol and camera traps deployed in identified fixed locations based on a protocol developed by the Periyar Foundation. The Tiger Conservation Plan for core and buffer zones of PTR includes all the requisites for long-term conservation of viable population of tigers, co-predators, prey and their habitats, maintaining the catchment and ecological balance and ensuring the livelihood security of dependent communities.

The Foundation also coordinates all the EDCs engaged in various protection and eco-development activities and supports them in developing their capacities. The PTR carries out an evaluation of habitat quality every four years as part of the national programme on “Monitoring of Tigers, Co-predators, Prey and their Habitat” by National Tiger Conservation Authority (NTCA) and Wildlife Institute of India (WII).

Biodiversity Outcomes

The EDCs having different skill-sets contribute to different aspects of biodiversity conservation yet the most simple but significant contribution has been the stoppage of their previous ‘illegal’ activities. This allowed the much needed ‘breathing space’ for nature to recuperate and regenerate. For instance the stopping of cinnamon bark extraction by the EVBC-EDC has improved the regeneration of cinnamon trees, quality and density of stands and eliminated cases of damage due to debarking. The sale of cinnamon bark has completely stopped since 2007 from a high of 30.4 tons in 1997. Similarly, since the Vidiyal EDC members stopped poaching and smuggling, there has been an increase in the population of different species. The intensive camera trapping study in Thekkady Range carried out since 2008 reveals presence of about 10 tigers in the range. Further, the density of tigers has increased from 3.88/100 Km² in 2008 (Periyar Foundation) to 5.41/100 Sq. Km² (WII) in 2011. The changes are visible in the elephant population as well where the proportion of tuckers in the population has increased from 16.95 percent in 2005 to 27.4 percent in 2010. The active participation of the EDCs in conservation has also led to improving the detection of illegal activities leading to reduction in incidences of sandalwood smuggling, forest fire and stoppage of black dammar collection that was fatal to black dammar trees. They provide additional feet on the ground improving the effectiveness of protection. They also help raise awareness of the tourists.

Improved well-being

Primarily the ecotourism programme, especially the ‘community-based, protection-oriented ecotourism (CBET) programmes’ being implemented in PTR aims at reducing the negative dependency on PTR and improving livelihoods of the community. The members of EVBC EDC and Vidiyal EDC are involved in the ‘community based ecotourism programmes’ (CBET) that generate provide supplementary livelihood to EDC members, for protection of the reserve and for eco-development activities. The Tiger Reserve gets around 0.6 million visitors annually and generated a total revenue of around Rs 15 million from various ecotourism activities in the year 2011-12. The members of the EVBC-EDC are excellent wildlife trackers and guides and hence act as guides in trekking and camping activities popularly known as ‘tiger trail’ on the carefully selected routes in the vulnerable pockets of the reserve. Similarly, ‘Bamboo Rafting’ and ‘Border Hiking’ activities involve members of Vidiyal EDC. An indirect advantage of the CBET activities is that it ensures presence of people (tourists, guides, staff) in the park, particularly in vulnerable locations contributing to protection. Around 36,000 person days presence is ensured annually in the reserve.

Sustainability and Replicability

The Periyar Foundation was created in 2004 as a mechanism for continued support to community based conservation and livelihood development activities. The foundation has since then managed to generate resources from various eco-tourism programmes, eco-development activities and surcharges. In the eight years since its formation it seems to have managed to further develop eco-development activities, added community institutions and add to its own capacities and skill-sets making the PTR self-sufficient in several aspects like scientific research and wildlife monitoring. Its success has already won it national and international recognition, particularly for converting the poachers into protectors, which has been a pioneering and rare effort across two states. The amendment to the section 38 V of the WPA making establishing similar foundations in all the tiger reserves in the country is evidence of its relevance. The Periyar Tiger Reserve and Periyar Foundation have been recognized as a 'learning centre' under Biodiversity Conservation of Rural Livelihood (BCRLI) Project.

Peringamala Grama Panchayat

Introduction

The Gram Panchayat¹ (GP) of Peringamala in Thiruvananthapuram district of Kerala is making significant contribution to conserving biodiversity through the collective efforts of its residents and in partnerships with various institutions of the State. In the process, the GP has been able to use various available legal instruments and institutional arrangements to generate and share benefits with the community, particularly the poor. The GP single-mindedly and unanimously pursues the objective of conserving biodiversity. Peringamala panchayat is located in the foothills of southern Western Ghats-one of the global biodiversity hotspots- and in the buffer zone of the Agastyamala Biosphere Reserve. As much as 65 percent of the land in the GP is forest with a wide variety of ecosystems, species and genetic resources. The range of ecosystems includes hills, Shola forests, Grasslands, Reed brakes and unique ones like the Myristica swamps besides human-made ones like tea and rubber plantations.

The GP has 19 settlements of forest dwelling tribal communities making it the largest settlement in the district. In what might be a rarity for any GP in the state and perhaps in the country, the Peringamala panchayat has a plethora of research and training units related to natural resources including the Jawaharlal Nehru Tropical Botanical Garden and Research Institute (JNTBGRI)-one of the largest conservatory gardens in South East Asia with the largest collection of Medicinal plants, Orchids, Bamboo, Wild fruits and various rare and endangered species. The other institutions include the State Forest Training Centre, Forest Research Unit, State Level Tribal Training School, State Banana Farm and District Agriculture Farm making the GP an ideal place for eco-education. These also equip the GP to deal with biodiversity conservation, protection and restoration evident from the various activities that it has undertaken over the years notable ones being preparation of one of best Biodiversity Registers (BR) in Kerala, documentation of indigenous knowledge of the tribal community, photographing the fauna and flora for the BR, awareness programs on sustainable use of resources and promotion of traditional food crops. The GP has also banned the use of plastic bags, promoted rainwater harvesting and biogas plants in the area. The total population of the GP is around 36,000.

The situation was not like this always and the GP had faced and overcome challenges to its biodiversity, mainly due to over-exploitation that endangered several plant species like *Garcinia travancoria*, *Embella ribes* and animals like the Nilgiri Tahr, Lion-tailed Macaque, Flying Squirrel, King Cobra.

Institutions and Processes

To take up concerted actions for conserving its biodiversity, the GP formed a Biodiversity Management Committee (BMC) under the Biodiversity Development Act, 2002 and invited researchers, traditional healers, naturalists, farmers, women, students and local politicians to be part of the committee. The BMC has eight executive members including the President and the Secretary a sub-committee that has active participation of College students and youngsters in the GP. The State Biodiversity Board provided backup and handholding support to the BMC. The BMC conducts its meetings regularly with participation from all its members. Functioning on democratic principles, it provides equal opportunities for all members to express themselves and takes its decisions either unanimously or with 2/3rd majority. Partnerships with community and various institutions forms the bedrock of conservation activities of the BMC.

¹ Gram Panchayat is the constitutionally elected body at the village level under the three-tier decentralized self-governance system

The rules and regulations of BMC, governed by the GP, are documented and known to all its members. The GP backs its commitment to conservation by providing financial support to the committee which in turn practices transparency in maintaining accounts.

Destructive extraction of Non-timber forest produce (NTFPs) like medicinal plants, honey, wild tubers was a major challenge for the area. The formation of the BMC provided a platform for the GP to educate its citizens, particularly the NTFP collectors and traditional healers regarding the dangers of over use and importance of conservation. Together they devised a practical management plan that identified certain pockets for collection of NTFPs while protecting the rest with help from the state forest department.

Biodiversity Outcomes

Awareness generation, participatory management and supported regeneration strategies of the BMC working with research institutions has managed to stem the decline of species and induce a turnaround in the population of some of the endangered ones. The BMC with the JNTBGRI collected and introduced propagates of many rare species such as *Coscenium fenistratum*, *Embelia ribes*, *Canarium strictum*, *Garcinia gummigutta*, *Persea macrantha*, *Piper spp.* *Myristica malabarica* which are showing better regeneration. The population of the key stone faunal species such as Nilagiri tahr, Lion tailed macaque, Flying squirrel, King Cobra have also increased. The productivity of the grasslands, second most dominant vegetation in the region, has increased considerably and now supports populations of herbivores like Bison, *Sambar*, Spotted deer, and Elephants. Conservation has also improved the ground water recharge helping farmers and helping to overcome drinking water problems in the GP.

Improved well-being

Majority of the population in the GP are farmers growing a variety of fruits, vegetables, tubers, rice, and plantation crops like pepper, rubber, coffee, tea, cardamom, ginger. The improved water table has improved their incomes. However, it is the tribal community with its dependence on forest which has both a major stake in and benefits directly from conservation. Poorer than the agriculturists, the tribal community is now able to improve its livelihood, food and nutrition security on the back of the conservation activities. They get direct employment in protection activities of the forest department as well as from their involvement in ecotourism as guides and providers of support services. The NTFP conservation of the BMC and the forest department has improved the collection of these items. Further, the tribal community is getting better value for their products due to primary value addition like drying and support from the Scheduled Caste/Scheduled Tribe department of the state in selling these products through their co-operative federation. Middle-men have been completely taken out of the value chain. Besides, the government through the GP has introduced several welfare measures for the tribal population like education, drinking water facility, solar lamps and transport for their produce to the market. In a significant and pioneering method of long-term sharing of benefits from conservation with the tribal communities, the JNTBGRI has patented an anti-stress and hepato-protective formulae 'Jeevani' using the indigenous knowledge of the Kani tribes of the area and shared the benefits arising thereof with them. Known as the TBGRI model of benefit sharing, it received international acclaim in the form of the 'equator' prize.

Sustainability and Replicability

The BMC is presently managing its operations with the financial support from the GP and technical guidance from the State Biodiversity Board. The BMC has plans to raise funds through various regional, national and even global sources that will help it sustain its conservation and community development activities. Inspired by the TBGRI model of benefit sharing the BMC is in the process of tying up with Kerala State Council for Science, Technology and Environment (KSCSTE) for support in patenting tribal knowledge and process of traditional medicine formulae having global demand.

People including the tribal community now have better resources to manage their food and livelihood security. As the TBGRI model was developed prior to the Convention on Biological Diversity (CBD) coming into force, the Peringamala Panchayat can rightfully claim to be the pioneer of patenting indigenous knowledge and sharing the benefit with the original knowledge holders. This model is worth replicating in similar environment in other parts of the country. Besides, the professional approach and commitment shown by the GP in pursuing the agenda of conservation holds useful lessons for other GPs.

Dambuk Attong Community Conservation Reserve Management Committee

Dambuk Attong Community Conservation Reserve was formed in 2009 in Dambuk Attong Aking¹, a Garo village, located in the Balpakram Baghmara Landscape (BBL) of the South Garo Hills District of Meghalaya. The Committee works towards protection of forests, livelihood security of the community and ecological viability of a larger landscape. The Community Conservation Reserve (CCR) has been established with the support of an NGO, Samrakshan Trust covering an area of 522 ha.

Communities protecting forest in India is not a new phenomenon and Garos² of Meghalaya are no exception. Unlike many parts of India, majority of the forests are owned by the community, which is legally recognized under the special provisions of the Constitution of India. Traditionally, they kept aside a part of the forest, close to their habitations as a village reserve, so that it meets many of their household and economic purposes. Dambuk Attong Aking³ is one such Garo village where the community has been protecting a large portion of their forest under the leadership of their Aking Nokma⁴. Dambuk Attong comprises of 21 households with a total population of 132 members formalised under the forest management activities.

Institutions and processes:

In a general meeting, a CCR management committee was formed consisting of 11 members including 2 women representatives. Amongst them, the Aking Nokma was selected as the committee's President. Subsequently a resolution detailing the rules and regulations of the CCR was enlisted and then formally adopted by the entire Aking. In tune with customary laws of the Garo community, the rules with regard to the functioning and decision making processes of the CCR management committee are only in the oral form. Members of the Management committee meet monthly with emergency meetings being called when needed. Decisions are taken with a quorum of 70% attendance of management committee members. All major decisions such as plantation, extension of CCR boundary, resource extraction, fining violators etc are taken during general *Aking*-level meetings which are convened by the CCR management committee, with at least 70% attendance of all households. The *Aking Nokma* always plays a crucial role in the decision making process especially in case of land use changes and social issues. The decisions taken in such meetings are conveyed by members of the CCR management committee to the households who were absent.

The committee has demarcated the boundary of their CCR, prepared a detailed land use plan for the entire Aking's forests, delineated areas which could be put to various use in the future and is presently in the process of drawing up a long term management plan for their forest reserve. Signboards with salient features of the CCR have been erected at strategic locations for spreading the word of conservation. Aking Nokma and CCR Management Committee President takes personal responsibility for monitoring the status of the CCR. He along with CCR management committee members visits the CCR twice a month to check for violations like hunting and logging signs and the findings are brought to the notice of the entire management committee and necessary action is taken. There is a plan to integrate villagers for monitoring of the CCR in the future. Besides, the committee makes effort to ensure cooperation from all the neighbouring Akings, towards which it conducts conservation awareness and education programs for creating a basic level of awareness in the community to protect the biodiversity rich landscape. A cluster of 6 Akings, each with a Community Conservation Reserve have been formed mainly by the facilitation of Dambuk Attong's CCR management committee. The cluster ensures improved forest protection and management of the forest in the area. Being a unified approach it also encourages other

¹ *Unit of land owned by a particular clan where rights of private ownership are also recognized*

² *A tribal community in Meghalaya, India*

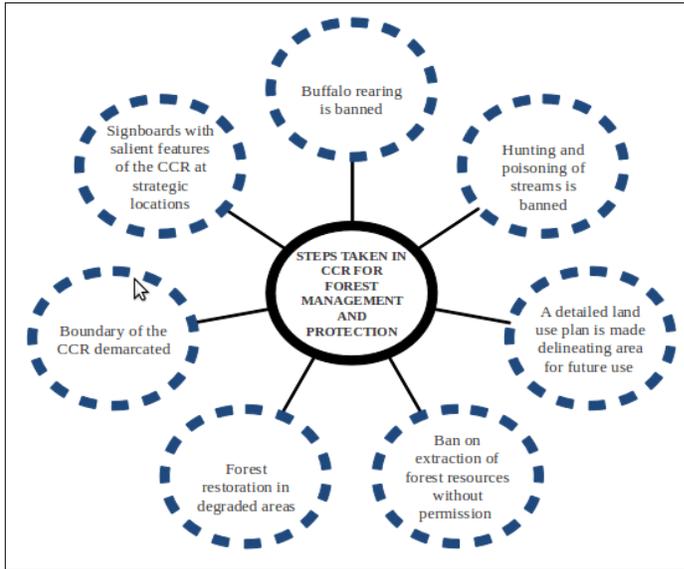
³ *Unit of land owned by a particular clan where rights of private ownership are also recognized*

⁴ *Traditional headman of the Aking*

Akings to set up their own reserves or protected areas.

Biodiversity Outcomes

The CCR management committee is responsible for management of all activities related to forest protection. There exists a ban on the rearing of buffaloes which had destroyed the forests due to overgrazing. Also the extraction of village forest resources like bamboo and timber without the permission of Nokma is restricted, hunting and poisoning of streams for fishing is also banned and anybody violating



the rules is imposed a fine of Rs 5000. With the forest protection measures, a regulation on jhumming is also in place. All forest areas are not allowed to be converted for jhum, thereby resulting in the increase of the forest stock which in turn ensures greater availability of forest resources for construction materials, fuel wood, fodder, wild vegetables etc.

An inventory of tree species of Dambuk Attong was prepared in 2011. With over 3 years of protection and monitoring, many species have a higher abundance, especially Chram (*Artocarpus chaplasha*), Bolchim (*Duabanga grandiflora*) and Gambari (*Gmelina arborea*). The Aking

also boasts of a variety of medicinal plants, availability of which has considerably increased after protection.

Dambuk Attong which lies in the BBL is home to the largest Asian Elephant, *Elephas Maximus* population and the endangered Hoolock Gibbon, *Hoolock Hoolock*. With improved protection of forests, an increase in the population of these species have been observed. Villagers have also observed an increase in population of the Indian Munjtac, *Muntiacus Muntijak* and wild pig, *Sus Scrofa*. Succinctly, survey by Samrakshan Trust reported that Dambuk Attong has 130 species of bird and 17 species of mammals. Around 320 species of butterflies are estimated to be present in the CCR.

Improved well being:

Apart from the biodiversity gains, the community has also benefited through the conservation efforts, important benefit being the availability of water in the streams which traverse through the forest. The villagers meet their water needs for household as well as agriculture from these streams. Villagers report that their conservation measures have resulted in the total prevention of forest fires in their *Aking*. Also they observe that soil erosion is considerably less compared to other neighbouring *Akings* who have little or no remnant forest. Under the supervision of the CCR Management Committee, non timber forest products (NTFP) like bamboo shoot, broom grass, green apple, vegetables, honey etc are collected from the CCR and sold commercially. Most of the products are sold in the raw form in local markets however a plan for value addition and marketing of such products is in being prepared and is in the process of being. Sale of NTFP is a thriving business in the village and a survey by Samrakshan Trust elucidated that a household earns an average income of Rs.43,480.00 per annum from the sale of NTFP. In collaboration with Samrakshan Trust, the CCR management committee is in the process of developing home-stays for tourism activities. Surveys on birds and butterflies have been undertaken to design and promote theme

based tourism which would hopefully start from this winter.

Kalpavalli Tree Growers Mutually Aided Cooperative Society

Category : Community stewardship: Autonomous community institution

Kalpavalli Tree Growers Mutually Aided Cooperative Society works towards creating a replicable model for protection, sustainable and ecological use of natural resources, particularly common lands for the sustenance and livelihoods of the common people especially small holder farmers and landless in a drought affected rain shadow areas of Anantapur District in Andhra Pradesh.

Anantapur District is a rain shadow arid zone, with only 2% forest cover and high inter-annual variations in precipitation. It is also the second most drought prone district in the country. Extreme poverty, fractured communities, inappropriate biodiversity management practices, lack of resources, recurrent droughts as well as lack of entitlement for the communities who are organised to protect and regenerate the common lands (recorded as "unassessed waste" in the revenue records), unilateral sale of common lands by the government to private companies resulting in loss of land, water and pasture are some of the main challenges of the biodiversity management in the region.

Kalpavalli MACS work covers around 3400 hectares of Kalpavalli (protected) areas of common lands and part of 8 villages in Chennekothapalli, Roddam and Ramagiri mandals of Anantapur district. Around 1500 villagers including 120 committee members, BMC members, youth leaders and leaders from the labour groups are involved in the functioning of the autonomous community institution. This also includes the main stake holders like Vana Samrakshana Committees (Forest Protection Committees - VSCs), labour sanghas (both men and women), sanghas of people with disabilities, small traders, toddy tapers, basket makers (men and women), shepherds, small holder farmers (men and women), youth and children. Decisions on membership fee, user fee and fines are taken collectively by the directors in consultation with the village elders.

Institutions and Processes:

The first VSC was set up in Mustikovila. The VSCs have been setting the standards for all other CBOs that have been set up to take up the eco restoration work. After the communities decide which areas they want to protect the VSC consisting 15-20 members are set up to carry out protection and monitoring of the activities. All the VSCs are federated to form the Kalpavalli Adavi Samakya (KAS). The VSCs are known by different names in the villages. Those who wish to be a member of the VSC have to pay an annual membership fee of Rs. 10/- per annum. All VSCs were federated into Kalpavalli Tree Growers Mutually Aided Cooperative Society in 2008. It at present has 15 directors, who meet regularly and 690 members. The VSC works with the village panchayat and it is envisaged by the Cooperative that in the future the panchayat will include eco restoration as a part of its developmental activities. Meetings of the VSC are held once a month on per-defined dates and attended by members. The agenda for the meetings include review of work done and any planning for work to be undertaken in the protected area. Other issues like the work of watchers, collection of fines, depositing of money collected from fines and sale of forest produce, seed dibbling, nursery, tamarind orchards etc. are also discussed.

In 2011, the Cooperative has facilitated the formation of Bio-Diversity Management Committees in all Panchayats where it is present. A total of 4 BMCs under the State Bio-Diversity Act have been formed, each consists 7 members including 2 women, 2 SC/STs, 1 social worker and others. Kalvapavalli raises funds from NREGA/CPR funds of state/central Governments, from membership fee collected, from grants provided by the Timbaktu Collective, supporting voluntary organisation and by means of its own business ventures.

Over the last twenty years, Kalpavalli MACS, in collaboration with the Timbaktu Collective (a voluntary organisation that has promoted Kalpavalli MACS), has developed a set of practices/activities for the regeneration of the area. Its work broadly includes organisation of the communities, formation of CBOs and registration as Tree Growers Cooperatives, training and exposure programmes for the members, appointing, training and monitoring the work of Watchers (one person for about 500 acres), survey and installation of name boards. Kalpavalli MACS has also been actively working towards formation of fire protection teams; monitoring of grazing and fuel wood collection, seed collection and dibbling, soil and moisture conservation, area demarcation by construction of boundaries and conflict resolutions.

The Kalpavalli regeneration efforts have influenced the Andhra Pradesh state Government, which has introduced Common Property Resources (CPR) programme on the basis of Kalpavalli model and allocate big chunk of NREGA funds to these type of works all over the state. It has also introduced the common land development programme on the basis of plantation works done in the Kalpavalli area.

Impact on biodiversity improvement and sustainability of resource base:

Intervention of Kalpavalli MACS has led to increase in tree density in the protected areas. According to a tree count done in April 1999, indicated that the 4000 acres of ridge had an average of 55 trees compared to the adjacent hills. Due to increase in the density of trees, water availability has also increased in the area.

Cows and bullocks have six different breeds with different characteristics, namely, Alikeri, Desapu, Jersey, Kwadi, Nati, Ongole. Ongole bulls (photo) look majestic, royal, attractive and alert. The Ongoles are fine, docile and suitable for heavy draught.

A total of 86 plant species including 34 main crops and 52 crop varieties were recorded from the agricultural fields. Rice has maximum varieties (15) including indigenous and hybrids. Local paddy seeds requiring less water are also being cultivated.

Impact on livelihoods/incomes and well-being of the community:

Success of the regeneration in the protected area is clearly visible through direct cash benefits received by the members of Kalvapalli MACS. The growing of thousands of date palms in the area has benefited the poorest of the poor in the area. While the VSC have been reaping benefits from the sale of Date palm fronds to basket and mat makers and from commission received from toddy trappers, the poor have been benefiting from dates, which they collect and sell to local markets in summer months.

S.No	Mode / Activity	No. of families supported	Income per year per family
1	Grass brooms	110	Rs.6500
2	Date palm fruits	120	Rs.4500
3	Date palm stijk	16	Rs.9000
4	Date palm leaves	56	Rs.9000
5	Neem seed unit	556	Rs.6000

Sl.No	Produce	Purpose	No. of families supported
1	Grass	Grazing - Cattle	93
2	Grass	Grazing – Small Ruminants	298
3	Grass	Roofing	100
4	Fuelwood	Fuelwood	690
5	Water in streams	Grazing	391

Until rains in 2004 broke it, Rayalaseema was going through a 3 year long drought. By 2003, villagers everywhere were selling their cattle for slaughter. But not the 8 villages where the Kalpavalli Samakhya has a unit. They had more fodder than they could use. From the 8,000 acres on the Kalpavalli under regeneration, close to 7,000 cart loads of fodder were carried away by 3,000 farmers in 40 villages of Roddam, Ramagiri, Chennakothapalli and Penukonda mandals. Additionally, the hills welcomed around 40,000 sheep from 23 villages. The regenerating hills had yielded Rs 27.50 lakhs of produce, and over 34,000 work- days of employment.

On the innovation front, the Cooperative has been exploring the options of eco-tourism in the protected area. It has also recently started a neem-cake unit, which is thriving to be a successful business unit. The protection work carried out by the Cooperative has created umpteen numbers of labour days of work for

Kanha National Park

The present Kanha National Park used to be a Indian forest landscape dotted with a large number of villages/ settlements with their inhabitants and cattle populations. These villages enjoyed considerable access to the nearby forests for their needs and demands of grass, fuel wood, timber and a wide range of minor forest produces. This automatically resulted in a perceptible biotic pressure on the forests and wildlife of the vicinity of these forest villages. Illicit felling, encroachment, wanton fire and uncontrolled collection of MFP in these tracts had already taken a considerable toll on these forests.

Kanha National Park of 940 sq. km and the Buffer Zone division of 1134 sq. km. are finally notified and there is no legal dispute. However, over the years, a dialogue has been established with the communities and there is a considerable decrease in mistrust. Presently, there are 161 revenue/ forest villages within the Buffer Zone.

Institutions and processes:

Acting upon this basic guideline, the Reserve Management has so far constituted 167 eco-development committees covering all these villages in the Buffer Zone. These are like micro-democratic institutions with their own elected office bearers, including women representatives. Each eco-development committee has been provided with a bank account to maintain its transactions relating to field works. The Reserve Management has prepared 142 village specific micro-plans in consultation with these villagers/ concerned eco-development committees. These micro-plans contain all the eco-development works that need to be taken up in these villages. The EDCs are responsible for carrying out all these works in their villages under the technical supervision of the Reserve Management.

Management undertakes the following strategies to ensure effective protection of biodiversity: The tiger cell, law enforcement, strike force, intensive patrolling of beats, monsoon strategy, elephant patrols, surveillance of footpaths & sensitive areas, control on illicit grazing, temporary patrolling camps, routine foot patrolling, night patrolling: on foot, by vehicles and night halt at camps, patrolling of sensitive areas, prevention of poaching by iron traps, footpath surveillance, saltlick checking, waterhole checking, checking for electrocution, patrolling by ex-army men, patrolling by Special Tiger Protection Force (STPF), fire protection measure: preventive and control and intelligence gathering & coordination.

Impact on Biodiversity Management and sustainability of resource base:

The Kanha wildlife ecosystem supports a wide range of carnivore and herbivore populations. General response of these species to the conservation practices in the National Park over the years has been very encouraging, and their populations have registered a normal increase. The National Park is renowned for its grassland habitats sustaining thousands of ungulates, including the highly endangered hard ground barasingha (*Cervus duvauceli branderi*). These grasslands were initially typical pasturelands of old villages. With the gradual change of status of this forest tract and managerial interventions and reduction of biotic pressure with village relocation, these old pasturelands have morphed into grasslands with a wide range of palatable grass species for herbivores. Needless to add, the Tiger Reserve has been renowned for a viable population of tigers.

Stringent protection and various management practices in the National Park have ensured a good prey base for three main species of carnivores, namely the tiger, leopard and wild dog. The carnivore species in turn successfully survive by strategic segregation and predation techniques.

The regeneration of sal (*Shorea robusta*) and its associates such as *Terminalia tomentosa*, *Pterocarpus marsupium*, *Lagerstroemia parviflora*, *Anogeissus latifolia*, *Lannea coromandelica* and *Bombax malabaricum* etc. once suppressed due to illicit grazing and indiscriminate fires, has revived with characteristics under storey and undergrowths. Many areas of the National Park and on the periphery in the Buffer Zone are now restocked with this original vegetation. The degraded bamboo forests of the Seventies have now given way to excellent growth of the species as an under storey, particularly in the Kanha, Sarhi and Supkhar forest ranges. Vegetation along river and stream banks has also revived with tall grass species in the beds. The Reserve Management has over the years created many water bodies in the National Park. Presently, due to stringent protection they harbour around 50 species of aquatic plants. Parihar & Kotwal (1989) has also recorded 17 species of rare plants in the National Park. Most old clearings/ openings in these forests have also gradually become colonized.

Impact on livelihoods/incomes and well-being of the community:

The main livelihood benefits for local communities in the National Park as well as in the peripheral areas are received from the employment generated through various biodiversity conservation works carried out in the Tiger Reserve. On an average, around 500 daily wagers from these communities are employed yearly by the Park Management. Approximately, around a total of 277000 man-days of employment was generated last year through various other conservation works in the Tiger Reserve. The park has invested majorly in water harvesting in many villages, leading to crop intensification. It has also invested into primary schools, community halls, drinking water and other such activities.

The Reserve Management has also taken initiatives in the basic health management of these village people through a modestly equipped dispensary with a physician located in the National Park. Ambulance services are also provided by the Reserve Management to the villagers in case of emergencies.

Under the voluntary relocation programme, 28 forest villages have already been rehabilitated amicably outside the protected area. There are still 17 forest villages inside the National Park. The Tiger Reserve Management has been gently persuading these villages to relocate outside the National Park and join the mainstream of development and progress. Presently, all the 7 forest villages lying inside the Critical Tiger Habitat have agreed for relocation under the NTCA, New Delhi guidance. Preferential treatment I given to community members of voluntary relocating villages in various recruitments, be it for guides, forest watchers and other manual jobs, besides the compensation.

Pir Jahania Jungle Surakhya Committee

Category: Community stewardship: Autonomous community institution

Pir Jahania Jungle Surakhya Committee initiated in the year 2000 from Gundalaba village is situated along the Diver River Mouth, Odisha, one of the mass nesting grounds of olive ridley turtles to conserve their adjoining forest areas and other natural resources. The super cyclone of 1999 almost destroyed the coastal casuarina and mangrove coverage, leading to high soil salinity (up to 15 parts per million) and reduced agricultural productivity. Villagers who were previously not very conscious of the need to protect the surrounding forests were driven to do so in order to prevent high salinity, minimize the intensity of future natural disasters, and ensure the ability to meet their daily livelihood requirements. This rich diversity in flora and fauna adds immeasurable value to local communities' livelihoods and well-being. The area has a good mangrove forest cover.

The women of the village of Gundalaba have pioneered the CCIs in the area by forming the Forest Protection Women's Committee. The village has 65 households and one woman from each household is part of the Pir Jahania Women's Committee. Main stakeholders of the committee are the villagers of Gundalaba and its neighbouring seven villages (Daluakani, Anakana, Gundalaba, Aisia, Siddikeswar, Sohana and Sribantapur), Forest and Wildlife Department, External stakeholders like Wild life research institutes like WII, WTI, WWF etc. They are working on Rotational patrolling, Protection and management of the nesting grounds of olive ridleys, protection of the mangrove forest and etc. The committee has been successful in protecting 15 square kms of casuarina forest and 5 square kms of mangrove forest in and around the mouth of the Devi River.

Institutions and processes:

The communities are actively involved in the conservation activity by developing their own management principles and monitoring mechanism. Each year a register is maintained to record the numbers of eggs of Olive ridley collected and the number of hatchlings released back to the sea. Since the area is small it does not fall under the legal regime of Protected Area. Women have taken the leadership role in the entire initiative and the committee members have elected one President, One Secretary and one Treasurer from amongst themselves. The tenure of the office bearers is for a period of three years and is rotational in nature giving chance to all the members to hold the post of office bearer. The villagers have formed village level action plans inclusive of the biodiversity management plans. The village develop the village action plan after identifying the risk and vulnerabilities of the village and then they develop the future action plans. Once the actions plans are approved by the Panchayat, fund flow can be directed accordingly from the Panchayats for the approved activities under NREGA or other state sponsored schemes or policies.

The monthly meetings are fixed on 25th of every month and for the meetings, a quorum of 50% of the total members needs to be met. The meetings are presided either by the President and Secretary and the resolutions are passed by the Committee only when it is accepted by two-thirds of the committee members. The decisions are taken by all the committee members and are done in a participatory way. All these rules are recorded and ratified by majority of the members. The meeting proceedings and resolution are also being recorded in the village register.

Impact on Biodiversity Management and sustainability of resource base :

After the widespread destruction of the mangroves by cyclone in 1999, initiatives of the Committee lead to newly regenerated mangrove vegetation (*Avicennia officinalis*, *Avicennia alba*, *Aegiceras corniculatum*, *Ceriops decandra*, *Acanthus illicifolius*, *Bruguiera gymnorrhiza*, and *Excoecaria agallocha*) has come up in the river system and the forest cover (especially of mangroves), going up 63% from 2.58 sq km in 1985 to 4.21sq

km in 2004. This is due to natural regeneration within newly formed mudflats and the concerted efforts of the local communities to restore the forest. The increased diversity has helped them to meet the variety of biomass, food and economic need in the village. The mangrove vegetation has attracted a lot of residential and migratory birds, which are also of tourist attraction. It also provides habitat for the Indo-pacific humpback dolphin, the finless porpoise, and the smooth coated otter, as well as many species of residential and migratory birds. Animals like Sea horses, are protected by national and international laws and the conservation oriented feelings of this group is highly commendable. This group has been saving Olive ridley sea turtles since past 12 years with the help of local youth. They actively help the local forest department in raising hatchery, collecting eggs to prevent them from being eaten by predators like dogs and Jackals, rearing them in the hatchery and by releasing them back to sea. This effort has also influenced the state government in bringing out stringent policies against the illegal trawling and ban on fishing (Orissa Marine Fisheries Regulation Act) during the turtle breeding season. This group also save the fresh water turtles of the area. Devi estuary is home for four species of fresh water turtles like Indian Flap- shell Turtles, Indian Tent Turtle, Ganges River Turtle and Peacock Soft -Shell Turtle.

The soil fertility has also increased in the region leading to good agricultural yield of paddy and groundnuts being harvested by the villagers. Apart from self- consumption, the villagers are also able to sell the agriculture produce adding to their income pie. Further, they are also able to grow vegetables in their backyard which is also an indicator of the increased soil fertility as a result of the dense forest cover due to the conservation initiative of the villagers. The coastal erosion has also been checked due to the growth of mangrove cover and the tidal surge does not affect the village now

Impact on livelihoods/incomes and well-being of the community:

Visible positive change has been observed in Livelihood condition of the community since they started they started the conservation activity. It took nearly eight to nine years for the agricultural lands to return to its normal conditions and today due to the initiative of the women group, the village is once again able to grow rice and vegetables in their fields. The yield of rice has increased in the last few years and apart from their self- consumption, the villagers are also able to sell rice which has increased their household income. Apart from paddy and vegetables the villagers also manage to grow cash crop like ground-nuts in their fields which fetches them good income.

The fish catch in the river has provided alternate source of income to the villagers. Earlier, a family could manage to collect only 1 kg of fish in a day from the river but after the mangrove regeneration, the fish catch has increased from 1kg in a day to around 5kgs or even more. From the fish catch each family earns around Rs 3200-4000 during the season. From the casurina forest, the villagers are able to meet the requirement of fuel wood and fodder and now they do not have to go to distant places for collection of fuel wood or take their livestock to distant places for grazing. There is also no conflict between these villages over the shared resources, as the boundaries and forest protection rules and regulations have been defined by mutual agreement of all seven neighbouring villages, many of which also have women's committees.

Sl. No.	Annual Source of Income	Average Annual Income
1	Selling of Paddy	Rs.12,000.00
2	Selling of groundnuts	Rs.25,000.00
3	Selling of fish and other aquatic produce	Rs.16,000.00
4	Total	Rs.63,000.00

The average annual income for each household has now increased to Rs 63,000 which had become almost negligible after the impact of super-cyclone of 1999. The decrease in migration from the village in search of

work is also a direct indicator of the improved livelihood conditions of the villagers which has been possible due to the initiative taken by the women's group.

Van Utthan Sansthan

Category: Co-Management

Van Utthan Sansthan (VUS) is a network of Village Forest Protection Committees (FPC) that are formed under the Joint Forest Management (JFM) programme in Udaipur, Rajasthan. VUS started in 1997 as an informal network of FPCs to address the issues pertaining to the implementation of JFM. The scope of VUS gradually expanded to enable conservation of forestlands as a community resource. Envisaging a long-term contribution of VUS in the region, the organisation was registered as a society in 2003. The contribution of VUS at present is centred on strengthening the protection and management of forestlands.

VUS works primarily in Udaipur where 42% of the total landmass is forestland. These are northern tropical dry deciduous forests. The work area of VUS is based in the midst of the ancient Aravali mountain-range, making the terrain quite hilly and locations remote to access. The forests play a vital role in ensuring productivity of lands on lower ridges and valleys, creating livelihood opportunities of local communities and sustaining their well-being, and most importantly maintain overall health of the ecology. However, over the years, these forestlands have severely degraded and their contribution to the region is increasingly on threat. The causes of degradation are complex, and include over-exploitation, mining, droughts, and illicit privatisation.

More than 50% population in VUS's area of intervention are tribal. In 1991, with the inception of JFM programme, communities were brought into the development and management of their village forests. Intervention of VUS covers five blocks of Udaipur District I.e. Jhadol, Kotra, Kherwara, Gogunda and Girwa. 84 FPCs are member of VUS. However, the outreach of VUS is 249 FPCs of the district. Each FPC comprises of 11 members with equal participation of men and women selected from the community. The main stakeholders of VUS are the member and associated FPCs, their communities, Seva Mandir and other local NGOs, and FD.

Institutions and Processes:

Working towards enabling conservation of forestlands as a community resource, VUS have been working actively to achieve its aim and goal. Monthly meeting of individual FPCs and cluster (10 clusters demarcated as per the divisions of FD) level meetings are organised thrice a year are attended by the representatives of VUS. The meetings provide an avenue to make villagers understand JFM and the role of FPCs in democratic forest governance. VUS also helps in formation of new FPCs and registering them with FD.

Trainings of FPCs are also organised by VUS on JFM and forest protection. In addition, VUS assists in resolving inter-village conflicts in regard to the boundary disputes, grazing and other traditional usufruct rights. In many cases, the village FPCs seek aid of VUS in negotiation with encroachers and arriving on a settlement. VUS also support FD in reducing illegal privatization of the forestlands. Given that the members of VUS are all locals, over the years, this has become a primary activity of VUS and the organisation has developed a strong edge on resolving conflicts.

Concerns such as mining, etc. that pose significant risks for forest management are taken further by VUS at appropriate level. When needed the matters are also brought in front of FD or respective NGOs. In a recent campaign, VUS has worked with FPCs, village panchayats and Seva Mandir on spreading awareness about the ideology and execution of FRA, and prepared the villagers to file 76 claims for community entitlements.

Impact on Biodiversity Management and sustainability of resource base :

VUS has been able to influence the protection and management of over 67,000 hectare of forestlands in more than 240 villages till now through formation and strengthening of FPCs and/or facilitating JFM implementation. The conservation efforts made by FPCs and local communities under the facilitation of VUS has also augmenting the vegetative cover. Over the last one and half decade, considerable increase in the key floral species in the region have been visible. Also, the vegetative growth is a result of both plantations of new saplings as well as regeneration of natural root-stocks. An internal assessment of Seva Mandir in 2010 supported those findings- biomass growth in Madla JFM site in Jhadol block was found to have reached to 15.74 tonnes per hectare in 5 years of protection.

Nonetheless, the efforts have certainly contributed towards enhancing the population of various animals. According to communities, animals like leopard, jackal, fox, hyena, rabbit, etc. are today seen more than a decade ago. VUS has also been making the communities aware about the watershed benefits of forestlands. It also encourages them to rejuvenate forestlands wherever possible together with the treatment of other lands of their watersheds. In addition to this, VUS has decolonised several hectares of encroached forestlands in Jhadol and other blocks. More importantly, the interventions have been able to recreate their identity as a common resource.

Impact on livelihoods/incomes and well-being of the community:

The rejuvenation and protection of forests have provided support to all four types of livelihood system i.e. agriculture, animal husbandry, forest produces and wage labour. The work on forestlands has given livelihood benefits to communities in three stages: (a) direct employment during implementation of JFMs, (b) mid-term livelihood in terms of better availability of fodder and other NTFPs, and (c) longterm in the form of watershed ecology leading to higher productivity of arable lands and social benefits.

The intervention of VUS in accordance has contributed in generating works of nearly 100,000 person-days through JFM. Furthermore, in several villages, communities appoint guards to protect their forests who are compensated in cash or kind by FPC.

The medium-term benefits, in terms of minor forest produces or NTFPs, generally become available in a quantity enough to be harvested after 2-3 years of the intervention. The communities get various NTFPs, such as fodder, fuelwood, tendu leaves, mahua flowers and fruits, gum, honey, etc., from the forests. Among all, better access and availability of fodder and fuelwood is viewed as a major benefit. Animal husbandry also contributes to a sizeable share in livelihoods of rural households.

Assessments show that availability of fodder from forestlands has risen to 1,000 to 1,200 kilogram per hectare by third year of JFM and protection. Every year, on an average households get about 500 bundles of fodder from the managed lands, which is worth of about Rs.10,000 to Rs.25,000 as per the local price. Currently, families in entire work area of VUS in total harvest about 40 to 45 lac bundles of fodder from their village forests, which has an economic value of more than Rs.1.5 to 2 crore. Fuelwood is another important produce of forestlands. The average consumption of fuelwood per household is estimated to be 70 kilogram² per week, which makes annual requirement of 249 villages with whom VUS is involved to about 1.25 lac tonnes.

Also, the communities regularly harvest mahua flower and fruit (known as dolma), gum, honey, tendu leaf, jatropa, ber, khajoor, etc. They are also a vital source of cash income for tribal families. Since these are available in different seasons, they offer a source of employment and income even during non-agriculture

seasons. The data collected by VUS from their members indicates that annually mahua flower of about Rs.15 lac and dolma of around Rs.10 lac are traded from their villages. Similarly, the annual business of tendu leaves from the area is of about Rs. 15 lac, gum is of Rs.5 lac and honey is of Rs.1.5 lac.