Opportunities for establishing informal conservation arrangements in the Periyar-Agasthyamalai Corridor of the southern Western Ghats

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Introduction

This project is among the first attempts that look at practical conservation solutions for landscapes lying proximate to but outside the formal protected area network. The project focused on human modified areas within the Periyar-Agasthyamalai landscape in the southern Western Ghats which has been identified as a critical corridor under the CEPF assessment. Opportunities for informal conservation in the region were evaluated from multiple perspectives: a) Identification of ground realities and challenges relating to conservation in the region, b) Discussion of key conservation interventions with local landowners and their willingness to conserve (particularly with respect to increasing/ maintaining native tree cover to enhance connectivity), and, c) Identification of preferences of landowners in terms of institutional partners and development related linkages that currently exist within the area. The results of this project are not only relevant for the Ranni Forest Division and surrounding areas. The sites that were surveyed are migrant settlements occupied by the poor and the landless during the a period of severe food shortage post Independence. These sites are part of a wider network of sites which are found in many forest fringe areas in the Western Ghats that are important for biodiversity conservation primarily due to their proximity to forests. Although it is important to underscore the relevance of context and place specificity in the context of conservation, some of the lessons from these evaluations can be of value to other settler pockets in the Western Ghats.

As an output of this project, an awareness handbook for modified and forest-fringe landscapes of the southern Western Ghats has been prepared. Initially, although a brief awareness brochure was envisaged, a number of participants including local administrators, officials, bureaucrats, and key informants requested a detailed document on conservation in modified landscapes. Being a politically aware and literate community, their interest is not limited to the operational aspects of conservation interventions; participants also expressed a desire to understand these approaches within a wider political and socioeconomic context. 'Balancing human needs and ecological function in forest fringe and modified landscapes of the southern Western Ghats' was prepared for this purpose. It is hoped that this handbook will provide an introduction to landscape level planning incorporating biodiversity and ecosystem services, as well as make people aware of the need for planning interventions that are socially just and equitable and ecologically appropriate.

Additional contributions: This exercise also filled an important gap relating to our understanding of political ecological aspects of biodiversity conservation in the region. Although the project itself

was of an exploratory nature, sufficient groundwork has been carried out under this project to enable actual interventions in the near future. As a follow up to this work, this investigator is exploring options for working with local landholders and institutions for designing conservation projects.

The Periyar-Agasthyamalai corridor located between two large protected area complexes is a human-modified landscape that has the potential to contribute to both biodiversity conservation and livelihood generation. The Ranni Forest Division situated within this region has extensive forests, and modified landscapes including forest and cash crop plantations, and home gardens. This project focused on human-modified landscapes bordering the forest division. Proximity to protected areas and significant tree cover has enabled the presence of significant levels of biological diversity in this landscape. However, at the same time, a number of conservation related challenges need to be overcome for successful.

Review of the ground situation and policy related challenges

In the context of forest-fringe landscapes in the southern Western Ghats, it is also important to understand the origins of some of the ongoing challenges which have the potential to bring about rapid landscape-level transformations. Although there has been previously documented transformations of significance, the history of settlement in this region that is of interest to the present study begins with the late 1940s and early 1950s. An extensive period of food grain shortage following India's independence from colonial rule and land reform saw the influx of large landowners, marginal farmers, kudikidappukars (formerly attached agricultural labourers who were hutment dwellers), and the landless from other regions of Central Travancore to the forests which were till now the realm of a few forest-dwelling nomadic tribal groups such as the Malampadaram. This migration - which was prompted by calls from the government to clear forest and cultivate rice - was widespread and continued over a period of time. Settler colonies became a typical feature of many forested districts in the Western Ghats. Although derived from different regional, caste and community denominations, a unique settler identity and livelihood ethic emerged, fostered by common experiences and obstacles which they surmounted as a group (e.g. abject poverty during the initial years, conflict with wildlife, etc.). Over a period of time, the Forest Department which emerged as the custodian of these lands persuaded some settlers to move elsewhere and others who remained were given title deeds with numerous restrictions. The intervening period also witnessed the implementation of far reaching forest related legislation (described in the next paragraph) which was protectionist in scope, and decades after their arrival

in the area, a number of settler families are yet to receive title deeds to their lands. Much of this revolves around the issue of encroachments (in addition to allotted lands) which is contested both by the local people and the Forest Department. More recently, in an effort to preserve these forests, there has been a tendency by conservationists to downplay factors such as historical use of forests in the area. Surveys in this landscape indicate that uncertainty over property rights have resulted in wariness of conservation schemes, especially those which promote the maintenance of native tree cover.

From an ecological perspective, a significant challenge in the region relates to the preservation of native vegetation within individual plots of land. A number of far reaching laws enacted by the state government relating to the vesting of private forests, protection of valuable trees and taking over by resumption of leased lands laid the ground for the Kerala Preservation of Trees and Regulation of Cultivation in Hill Areas Ordinance, 1983, and the Kerala Preservation of Trees Act, 1986. The latter legislations were brought about to curb rampant and indiscriminate clearing of tree cover from private lands and to promote soil and water conservation in ecologically fragile upland areas. In a marginalised region already troubled by land tenure related issues, these restrictions have been viewed by local people as unfair and has resulted in a negative attitude to tree planting. Commentators on forest legislation in Kerala have pointed out that in contrast to large scale tree planting drives by the farm and social forestry sectors, the provisions of this legislation make people wary of cultivating trees in their homesteads (Thomas and Johnson 2008). In the study area a number of direct confrontations between the local people and authorities were recorded over tree felling from private properties. Surveys in the region also reveal that local people often inhibit the regeneration of native species as they see no benefits from trees, the use of even common species such as jack and *anjili* (*Artocarpus hirsutus*, a Western Ghats endemic) for household purposes is restricted or problematic (bribes demanded for genuine use permits, extended court cases for illegal felling, etc.).

Human-wildlife conflict is a defining feature of many forest-fringe communities. High levels of crop depredation has been reported by many households living proximate to forests in the southern Western Ghats. In the agricultural landscapes adjoining the Ranni FD, crop damage by wild boar, elephants, giant squirrels, flying squirrels porcupines and bonnet macaques have been reported. The highest degree of crop depredation is attributed to wild boar which is known to travel the furthest distance from forests into agricultural landscapes. Bonnet macaques are more frequently encountered in modified landscapes than within forests. Crop damage by elephants, although potentially catastrophic is less frequent. Compared to most other species, people appear to have a greater degree of tolerance towards elephants. Extended periods of conflict have prompted most farmers to prefer crops such as rubber and *kolinji* which are less palatable and therefore

less prone to depredation. In fact, a number of survey respondents were of the opinion that the current agricultural land use pattern was primarily a response to an extended period of conflict. A recent government order permitting the culling of wild boar (specifically problem animals) is expected to bring relief to farmers in five districts in Kerala including Pathanamthitta district where the study area is located. Compensation schemes for crop damage seem to be viewed unfavourably by landholders. Many individuals were critical of the tedious compensation procedure where crop loss had to be verified with both the Forest Department and the Krishi Office and the compensation received was in many cases reportedly less that the amount spent on procuring it.

Trade agreements, policies and markets operational in other parts of the world can sometimes act as external drivers of socio-economic and environmental change. Moreover, many such drivers often bring about abrupt, drastic change to agricultural land use. Studies from a many countries also show that agricultural incentive policies, taxation, subsidies and trade policies are more influential than forest policies in determining land use. Agricultural subsidies, market intervention by the government, promotion of exports and international trade agreements have been identified to be instrumental in the development of plantation crop markets. The forward looking land policies of the erstwhile kingdom of Travancore and the new state of Kerala which brought about reform and equity also encouraged extensive conversion forest and agricultural land to plantations especially rubber. Large tracts of forest land were also leased for the cultivation of a number of plantation crops including rubber. More recently in the 1980s, rubber has also been planted with funding from schemes such as the Western Ghats Development Programme (http://www.sfckerala.com/state_farming_%20about_us.htm). In the recent rubber boom, it has to be noted that in the southern Western Ghats, agricultural lands (as opposed to forest) are being replaced by rubber plantations. While the contribution of this plantation crop to the economy and livelihoods continues to be significant to the study area as well as to the state of Kerala, as exotic monocultures their benefits to biodiversity conservation are limited, and presents high risks from price fluctuations and to food security. For South Asian smallholders in particular, rubber mixed cropping systems with fruit, medicinal plants and timber (that enhance food security, livelihood benefits and local biodiversity) has been recommended. In the forest fringe areas of the southern Western Ghats, rubber is one of the few crops that can withstand crop raiding from species such as wild boar. The role of revenues from rubber in arresting conversion of private lands to residential properties need to be explored in detail. As rubber brings in significant revenues, it has been speculated that sales of land are more likely only in exigent circumstances.

Pilgrimage related activities have escalated in the region over the past few years. The Sabarimala temple situated within the region has become one of the most popular pilgrim centres in southern India. The areas in and around Ranni Forest Division, particularly routes within the Gudarakal Range are used extensively during the pilgrim season. Spillover sites in the neighbouring panchayats (especially high vantage points from which the Makarajyoti is visible) also attract an increasing number of pilgrims. However, as a pilgrimage that involves millions of devotees, there are extensive and ecological and economic dimensions, some of which are challenges. Among the significant ecological impacts that have been reported include the extensive pollution of the upper catchment of the Pampa River from human waste, degradation around the temple complex, major approach routes, grasslands and reservoirs such as Pampa and Kakki (http://www.cedindia.org/2008/10/study-of-ecological-and-environmental-status-of-upper-catchment-area-of-pamba-river-basin-using-satellite-data/). There has also been reports of ingestion of food and plastic waste by wild mammals such as elephants, wildboar, sambar, primates, etc. and elephant deaths have also been reported in this connection. A few incidents involving direct conflicts between elephants and pilgrims have also received press. A number of cleanup drives and studies that have been launched to tackle these issues, and range from regular waste removal drives, plastics-free campaigns and awareness programmes by the Van Samrakshan Samithi (VSS), the Forest Department and non-governmental groups and focused studies by local groups (e.g. a study by TIES reporting on plastic in elephant scat). While these initiatives are truly commendable, it cannot be stressed adequately that a larger framework for ecological sustainability of the pilgrimage has to be devised considering the enormity of the situation. It has to be also noted that in addition to the revenues received by the Travancore Devaswom Board (TDS), the pilgrimage is a lucrative business season for a large number of people, from all denominations, including the local communities and a temporary populace that services the pilgrims. Since 1998, a number pilgrim amenity centres have been managed by the fringe-area communities under the Eco-development project that was initiated in neighboring Periyar Tiger Reserve in that period. An economic analysis of the latter reports a number of drawbacks. However, the expansion of the Sabarimala pilgrimage and associated business opportunities have acted as a catalyst for further demands of development of other smaller pilgrim centres in the region. A notable example is the Aluvankudi temple in the Gurunathanmannu-Kunnam area which is visited by pilgrims during Mahasivaratri. This pilgrimage is of a more regional nature. The Gurunathanmannu-Kunnam area is considerably more backward than the surrounding areas and in need of basic facilities. However, any development in the area needs to be first assessed for environmental sustainability.

Mechanisms and potential sites

Landowner surveys were one way of ascertaining aspects such as socioeconomic status, environmental awareness, perceptions towards wildlife and biodiversity and willingness to conserve among local communities. During the project duration we carried out surveys of close to 500 households on the various themes mentioned above. Small landholdings ranged in size from 2 cents to over 5 acres and distances up to 10 km from forest patches were covered (Note that these distances are those reported by interviewees; initial exploration of actual map distances shows significant difference in terms of actual distance from closest forest patch). Over 60% of landholdings were less than 1 acre in area and close to 85% were less than 2 acres. To inform future reconciliation efforts, we carried out exploratory surveys along two key perspectives. The first related to the willingness of households to participate in a number of conservation interventions and additional income generation schemes that are prevalent in the developing tropics. The second series of questions were aimed at identifying potential institutional partners and networks as well as linkages with existing and proposed development schemes. A summary of results is provided in the following paragraphs.

Choices: Discussions with private landowners were carried out to identify their preferences for potential multiple use arrangements that are typically associated with biodiversity conservation and the maintenance of ecosystem services. These included activities such as planting trees or protecting small parcels of land along the lines of payments based schemes, other income generation activities such as bee-keeping, medicinal plant conservation, organic farming, etc. and recently introduced schemes such as insurance against crop-raiding which seems to be finding support in some parts of the world. When compared across the entire group, the largest number of landowners expressed an interest in protecting small parcels of land. There was also a reasonable amount of support for protection of existing trees and planting trees on a payments basis. However, preference to these options (land and tree protection) was almost always expressed along with a clarification that it would be ideal only if accompanied by guarantees of protection of land ownership in the future. As mentioned before, native tree protection legislation in private landholdings in the area has been viewed as problematic and people are wary about any changes that increase native vegetation cover. However, high levels of crop depradation (nearly 65% of interviewees reported crop damage) has resulted in few agricultural opportunities for people other than rubber cultivation and could be one of the reasons for this choice. Local landholders also expressed an interest in learning more about insurance programs related to crop depradation. In addition, during questionnaire trials a number of key informants suggested linking health insurance benefits in lieu of provision of ecosystem services and biodiversity protection. Although in our knowledge, there are very few experiments related to personal healthcare and

other benefits (and their corresponding institutional and other linkages), this was explored as an option since the suggestion came from within the community. As a marginalised and backward area with respect to infrastructure and facilities, there was widespread support for these options. Among additional income generation activities, local people were in favour of familiar activities such as bee-keeping and medicinal plant cultivation which were carried out by some on a subsistence basis. In this context, it is also important to mention the current interest in the region in medicinal honey production from *Trigona iridipennis* colonies. Used extensively in ayurvedic medicine, this product is being promoted regionally. The success of the NREGS initiative could also be reflective of an interest in wage generation tie ups which were suggested as an option. Currently, there has been interest in India about linking NREGS with environmental protection.

The implementation of landscape level strategies also call for the evaluation of institutional arrangements. This involves the development of the right institutional structures, particularly the identification of the network of institutions that play key and ancillary roles. Ideal networks evolve participatory consensus between multiple stakeholder groups. In this project, landholders were also requested to list their preferred partnerships with already existing groups, networks and departments. Among all partnerships, there was overwhelming support for the Kudumbashree project which has been a successfully adopted model in this part of Kerala, followed by the Panchayat, NREGS, a new collective or the VSS. In an area where agricultural and livelihood related distress have resulted in desperate measures such illegal arrack brewing (which in turn impacts family incomes), schemes like Kudumbashree have helped women tide over these crises by making them more financially independent. In some parts of Kerala, Kudumbashree's innovative approach to food security is reported to be a success, especially farming collectives that lease land to cultivate it for subsistence, and sell the surplus locally. The positive impacts of Kudumbashree in this area is not just restricted to poverty alleviation and but also in social inclusion and making women politically aware and empowered. A number of women and women's groups interviewed in the region expressed an active interest in income generation activities related to sustainable management of landscapes. The convergence between Kudumbashree activities and those of the National Rural Employment Generation Scheme (NREGS) has had a positive impact in the Ranni region. In Kerala, NREGS has been reported to be effective in raising social capital in the state (especially in inculcating a better work culture), and has been already linked with natural resource management through the Forest Department. There has also been plans to link NREGS with large scale social forestry initiatives like '*Haritha Keralam*' (Green Kerala Scheme) as well as calls for modification of permissible lists of NREGS works for implementation of the Forest Rights Act. The scope for linking NREGS with landscape afforestation programmes and specific schemes (e.g. *Vazhiyorathanal Padhati* - Road-side planting of shade trees initiative) is very much present and is already being explored. In the Ranni

FD, it was noted that the VSS was active in some areas and was receptive to discussions about sustainability in modified landscapes. The fact that most VSS office holders are local representatives, seems to play an important role in buffering interactions with the Forest Department.

In the case of the southern Western Ghats, such networks could incorporate a number of actors including (but not restricted to) government departments (e.g., forests, agriculture, public works), *Vana Samrakshana Samitis* (VSS), Eco-Development Committees (EDCs), local self government institutions such as panchayati raj institutions, scientific organisations, NGOs, self-help groups, labour unions, etc. The Kerala Forest Department which is one of the most foreward looking forest departments in the country has been very receptive to inclusive conservation strategies such as participatory forest management (PFM). Unlike a number of other state forest departments, KFD has a history of working well with many stakeholder groups including local communities, researchers, etc.

The choice of interventions are contingent on a number of factors. Some of these may be locality or region specific (e.g., willingness/ resistance of a local community to adopt a strategy), or could be derived from previous experience (e.g. the success of collective movements in Kerala). The links between, land use change, conservation, poverty, and sustainability in modified landscapes are complex and dynamic. The sustainable management of these landscapes is at present an emerging area of study. As a result, our understanding of these complex entities is limited. However, for effective decision making, planners have to use available information, instinct and knowledge of their system.

Activity	% favourable responses
Protecting parcels of land	23.5
Any insurance scheme	17.8
Bee keeping	10.8
Wage generation tie-ups	10.2
Any income generation activity	8.7
Compensation for crop loss	7.3
Insurance for crop loss	7.3
Medicinal plant cultivation	6.6
Ecotourism	3.7
Planting/ protecting forest trees	3
Planting trees for use	0.6
Organic farming	0.3
Certification of farm products	0.1

N = 1024

Preferred partners	Number of responses
Kudumbashree	328
Panchayat	180
NREGS	171
New Collective	160
VSS	84
Other collectives	50
Forest Department	47
Agriculture Departn	33
SHGs	13

N = 1066

Please note that the above two tables are simple summaries that give a general picture. Actual interventions for different groups will be supported by standardisation and detailed multivariate analyses. GIS based mapping of some of these aspects is now being attempted (not part of the outcomes of the CEPF project). The scope for multiple interventions in the same area is being explored by continuing discussions. Additionally, many of the approaches suggested have their own advantages and drawbacks which should be understood by local level planners and the communities themselves before they are offered up as solutions. The social and ecological consequences of some currently operational conservation interventions have been outlined in an awareness manual for local level planners, bureaucrats and interested members of the lay public.

Awareness handbook

A detailed awareness handbook (Appendix 1) titled, 'Balancing human needs and ecological function in forest fringe and modified landscapes of the southern Western Ghats' has been prepared. This document emerged from a series of discussions with landowners, community leaders, local government officials and bureaucrats, with whom potential multiple use arrangements for forest fringe areas were discussed. While most participants of the interviews were familiar with the benefits derived from forests and natural resources, many individuals expressed an interest in understanding the dynamics of human-modified landscapes in greater detail. During the course of our discussions, it was also communicated to the author that a simple document introducing landscape level planning incorporating biodiversity conservation and ecosystem services, and outlining some of the pros and cons of proposed interventions with potential for human welfare would be welcome. Being a politically aware and literate community, this interest was not limited to the operational aspects of conservation interventions, participants also expressed a desire to understand these approaches within a wider political ecological context. Therefore, in addition to providing an overview of ecological aspects, this handbook also hopes to inform interested parties about the various interventions that are currently being adopted in different parts of the developing tropics and their linkages with development. The assumptions underlying some of these concepts are problematised and wherever appropriate, discussed in the context of the Western Ghats. Although the study area where the surveys were carried out in areas adjoining the Ranni FD, this handbook could be of use in a wider context - especially settler pockets in forest-fringe areas in the southern Western Ghats. The handbook is not a step by step guide on designing interventions, nor does it promote any one approach, rather its intent is to provide decision-makers with information on the key features of each of these interventions, some of the contexts in which they have been effective (or not) and the potential benefits and pitfalls. It is hoped that this handbook will provide a set of decision support tools for managers involved in landscape level planning and management.

Stakeholder dialogue

Settlers with small landholdings form the primary constituency for potential conservation measures. Our survey reveals that this stakeholder group is organised under various political and religious factions, self help and micro-finance groups. In the Seethathode Panchayat where detailed household interviews were held, we decided against holding a single formal meeting of all stakeholders under the Panchayat as the recent elections resulted in severe factionalism and frictions between the current representatives and their predecessors. In lieu of a single

stakeholder dialogue, we instead initiated discussions with the representatives of various stakeholders groups. From these discussions the three most promising groups identified for potential linkages include the Vana Samrakshana Samitis (VSS), the Kudumbashree (self help groups for women) and National Rural Employment Guarantee Scheme (NREGS). Although the project term is over, further discussions for actual interventions will be carried forward over the next few years.

This was a short term project with limited objectives. Since the project was of an exploratory nature, the objectives listed in the previous section were easier to achieve. One of the challenges which this researcher faced related to discussions with landholders and plantation owners who cultivated rubber. Discussing alternate conservation interventions when rubber prices were at their highest did not seem very attractive to a section of the population.

Additional perspectives and challenges

Though not relevant for the completed project, from the perspective of long term future objectives for the region in general, a few very significant issues need mention. The first is the level and extent of human wildlife conflict (in this case, extensive crop depradation) which seems to have been under reported and may have to be dealt with as a stand alone issue over the long term. Native tree preservation in the region is also a contentious issue and has to dealt with changes in policy and implementation. Finally, the impacts of small-scale interventions have the potential to be negated/ impacted by large scale drivers of landscape transformation. In this area, these drivers include trade agreements and pricing of plantation commodities, particularly rubber and also the increasing trend of conversion of agricultural land for residential properties.

Though open to new projects and initiatives, a number of questions were raised regarding the intentions and involvement of outside funding/agencies such as CEPF. It is uncertain if this is a positive or negative impact, or an impact at all in any way.

As the success of most conservation projects are contingent on community buy in, political ecological evaluations relating to conservation interventions are extremely significant. However, the relationship between political, economic and social factors with environment still remain a

poorly explored aspect of conservation projects. In this project, it was possible to explore a number of these factors.

Due to the short duration of the project, it was not possible to undertake detailed surveys in Konni and Achenkovil. Surveys of these two additional forest divisions (although not promised as outcomes) was envisaged.

During the initial stages of the project, some survey methodologies were experimented with research assistants with a background in conservation. However, we felt that this would not be viewed very favourably by the community who perceived researchers to be biased and could translate to inaccurate data. Therefore, to reduce this type of bias during the surveys, the investigator was assisted in the work by individuals (with prior census experience) selected from within the local community. These individuals assisted in obtaining data especially at the household level. Their prior knowledge and familiarity with the system translated into greater access to the community as a whole for the investigator and was sometimes critical in obtaining some of the information which was of a sensitive nature. All participants (including land owners and key informants) were informed of the nature of the project with the help of a flier that was developed in the local language (Malayalam). Prior consent was obtained and this was an important aspect of the project which was greatly appreciated by officials and community members.

Many of the policy and conservation related challenges that have been identified for the study area find resonance with other forest fringe landscapes in the Western Ghats. These include agricultural distress, protracted human wildlife conflict, uncertain land tenure and persistent marginalisation and poverty among settler populations. Native tree preservation in private lands bordering protected areas is another bone of contention that has been identified as problematic across the region. The results from this study suggests that although there are common challenges, the extent and interplay of these problems may vary across sites. The design of interventions therefore needs to be context and place specific.

Within moderate additional effort, the awareness handbook that has been developed could be adapted for distribution in other areas in the Western Ghats as well.

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