

Socio-Economic Assessment and Planning in Corridor Conservation Initiative

Assessment at Kallar Elephant Corridor

Dr. K. Thirumaran

Associate Professor, Department of Architecture
National Institute of Technology
Trichy, India

Ar. R. Renganathan

Research Scholar, Department of Architecture
National Institute of Technology
Trichy, India

Wildlife corridors provide connectivity to isolated populations and facilitate movement of animals among the isolated habitat patches. Conservation of corridors ensures contiguity of large landscapes and ecosystem functions within. There are present and future threats to the kallar elephant corridor in nilgiris landscape. Assessment and mitigation of the various threats were carried out. The threat to the habitat by anthropogenic pressure were focused in the socio-economic assessment..

KeywordsHabitat,livelihood,dependancy,economy,NTPF, firewood

I. INTRODUCTION

Habitat loss and fragmentation are serious threats to the conservation of biodiversity (Rosenberg et al 1997).Habitat fragmentation often leads to isolation of animal populations and small populations among these have higher chances of going extinct (Rosenburg et al ,1997).Wildlife corridors provides connectivity to isolated populations and facilitate movement of animals among the isolated habitat patches(Soule Gilpin 1991,).Conservation of wildlife corridors ensures the contiguity of the landscape and increases viability for many species.

The forests of Nilgiris are habitats for large populations of elephants, are contiguous to a large extend, except in places such as Kallar where forest connections have become narrow. There are present and future threats to the corridor. The quantification and mitigation of threats were carried out for the corridor by the conservation planning initiative under collaboration of WWF India and ATREE Bangalore.

The location of Kallar corridor falls in foothills of Nilgiris within the Coimbatore circle of forests. There are number of threats to the existence of this corridor. Narrowness of the corridor and presence of bottlenecks are caused by changes in land use, hindering usage of the corridor by elephants. The heavy volume of traffic in the highway intercepting the corridor was also perceived to be a threat to the elephant movement. The anthropogenic pressure by local people living in the vicinity of the corridor was initially perceived to be a threat to the habitat quality. The conflicts between human and elephants was also probed in the conservation planning exercise.

The anthropogenic pressure i.e. the livelihood dependency of local people from settlements in the vicinity, is a direct consequence of the socio-economic status of the people. This relation has been established and emphasized in United Nations “Man and Biosphere program”. The concept of biosphere reserve states that “*Promotion of sustainable use of natural resources through close co-operation with local communities, taking advantage of traditional knowledge, indigenous products and appropriate land management. Regional and local development is promoted by incorporating all concerned social actors in the reserve planning.*”

This concept on a smaller scale was applied to corridor planning. The anthropogenic pressure on the habitat and its quality was probed. Livelihood activities causing pressure on the habitat were cattle grazing, Firewood extraction, NTFP extraction and fodder extraction.

II. THE STUDY AREA

Anthropogenic pressure on the Kallar corridor is exerted by the hamlet of Kallarputhur located in close vicinity within revenue limits of village Odanthurai in Metupalayam taluk. The hamlet after the tribal resettlement initiative in 2000 had grown from a few households to 400 households presently. There was an inflow of non tribal populations to the hamlet from the vicinity after the resettlement program.

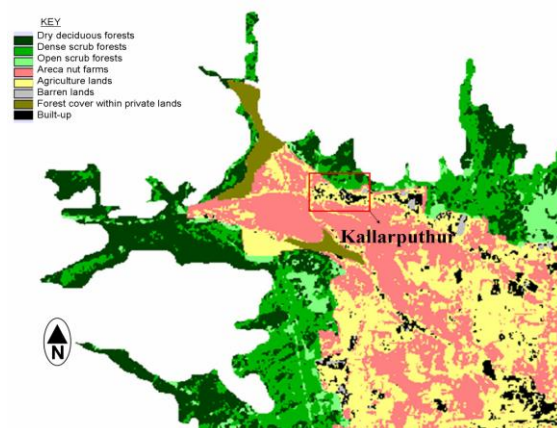


Fig: 1.1:Kallar_landusemap2006 – Location of Kallarputhur hamlet
Based on classification of LISS IV image

III. METHODS

The degree and magnitude of dependency of local people on forest resources was assessed by a questionnaire survey with households as the unit of probation. There were 400 households in Kallarputhur, 119 households of the total were tribal and the rest non tribal. A sample size of 30 households was selected to represent the 119 households of the tribes. The degree of pressure mainly caused by the tribes was assessed. An equal sample size of the non-tribal population was also selected for the survey to establish the economic status of the settlement as a whole and to find the percent of non tribal households' dependant on the forest resources. Households for the survey were selected with a set of randomly picked numbers from each stratum. The sampling was stratified simple random sampling.

Major forest dependency activities such as cattle grazing, firewood collection, ntfp extraction and fodder extraction were perceived to be prevalent from an initial pilot visit. The pilot visit was done by interviews with members of the village forest committees of Kallarputhur. Hence the purpose of the questionnaire survey was to quantify each of the activities to the possible extend and to bring out the major dependency activity. The amount of the various non timber forest produces extracted was quantified for a period of one year. The computation was done based on the seasonal availability of the produces, frequency of visits by the people and the weight of the head load carried. The weight of head loads was measured and error was computed against the quantities from the questionnaire.

Secondary data from forest range office was used to establish the scenario of resource extraction. Data from census 1991 and 2001 was used to support the findings of the survey.

IV. RESULTS

A. The Economic Scenario

Of the total 60 households surveyed 85% of the households were dependent on the areca nut farms for their livelihoods i.e. engaged as agricultural laborers in the farms. 33% were dependent on cattle rearing and 20% were engaged in other occupations such as vendors and laborers in railways and mills.

The annual income was computed for each household considering the income generated in the form various activities undertaken and the period of involvement. The Range of annual income for Kallarputhur was from Rs12000 to Rs216000 with an average of Rs37000. Exclusive percentages of each occupational activity were obtained by considering the major income generating activity of the households. 97% of the tribal households were involved in areca nut farms as laborers and the rest 3% in other occupations, whereas 33% of non-tribal households were involved in other occupation. The income generated from cattle rearing was low. Cattle rearing were a supplementary activity. Tribal and non-tribal households involved in cattle rearing were 70 and 30% respectively.

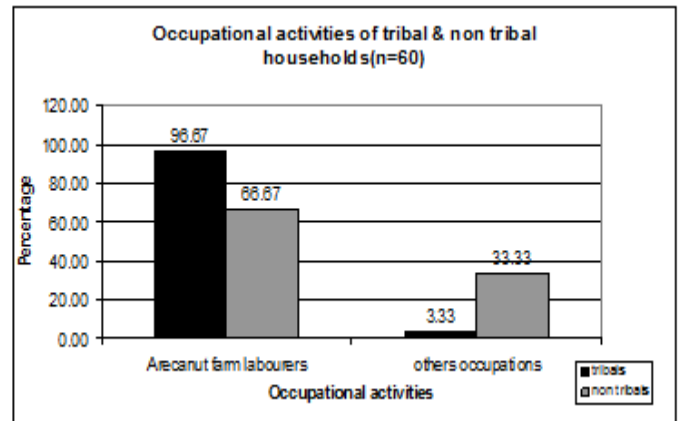


Fig: 1.2: Percentage of tribal and non tribal households in different occupational activities

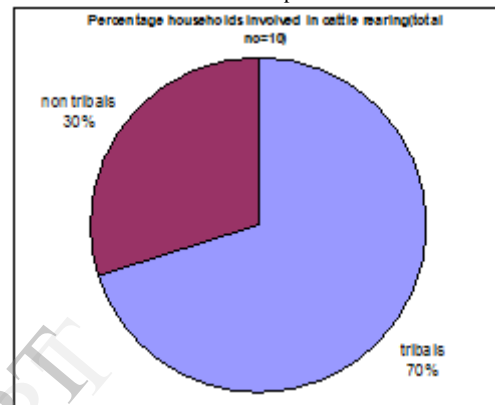


Fig : 1.3 :Percentage of tribal and non tribal households involved in cattle grazing

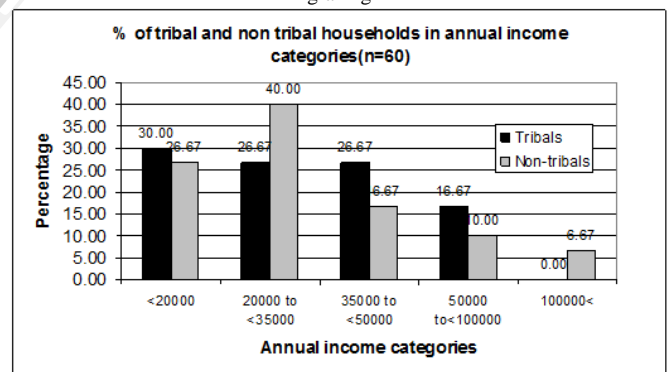


Fig: 1.4: Percentage of tribal and non tribal households in annual income categories

Five categories of annual income were derived using a frequency distribution and mode function for the annual income of 60 households. Tribal households were equally distributed in all the income categories. The high income category non-tribal are a few households of government employees and shopkeepers. High percentages of non-tribal households in the two lowest income categories reveal the possibilities of forest dependency.

B. Livelihood dependency on forest resources

Forest dependency was assessed with a close end question (yes/no) on visit to the forest. The purpose of the visits was related to the activities of cattle grazing, firewood collection, ntfp extraction and fodder extraction. In Kallarputhur 42%

households of the settlement were dependent on the forest on one way or the other. As inferred earlier 23% of the non-tribal households were dependents on forest resources. Small proportions i.e. 13% of the tribal households were not dependent on the forests resources.

C.Forest dependency activities

The major forest dependency activities in Kallarputhur were cattle grazing, firewood collection, NTFP extraction and fodder collection. Based on the number of households involved the magnitude of each activity was perceived. Firewood collection was the major activity with 68% of the households involved in it. The 24% of the households engaged in NTFP extraction were employed by the village forest committee, during the season of resource availability.

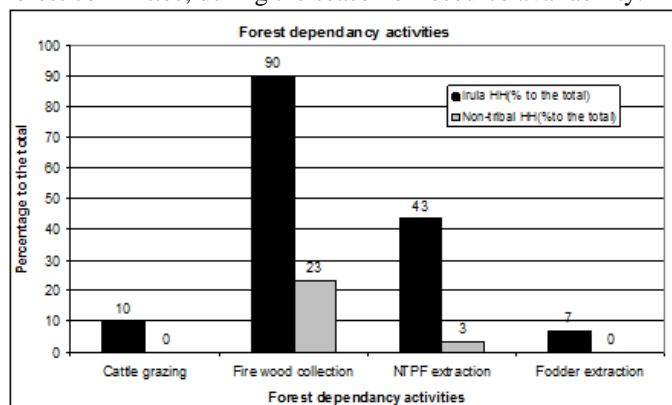


Fig: 1.4: Percentage of tribal and non tribal households involved in various forest dependency activities

Among the tribal households firewood collection and ntfp collection were the major activities. Firewood extraction was also carried out by 23% of the non tribal households.

Quantity of produces extracted in the above mentioned activities were quantified for a period of one year. The produces extracted were firewood, gooseberry, soap nut, kadukai, phoenix palm and spinach. The parameters used in computation were seasonal availability of the produces, frequency of visits by the people and the weight of the head load carried.

Firewood and raw spinach were extracted by the people for household use of cooking and consumption. Hence the quantities were estimated based on variables from the household survey. Other produces were extracted by the village forest committees on a lease basis, e the local people were employed for collection. Hence the quantities of these produces were estimated based on the number of people employed and the head load corresponding to the season of availability of the produces.

In the hamlet of Kallarputhur an average of 1.15 persons (standard error=1.20) per household were engaged in firewood collection on an average of 2 days (standard error=2.51) a week. The average of weight of head load carried per person obtained from the questionnaire was cross checked with the sample mean of a variable, of seven values of measured weights. The average weight of head load carried per person was 14.48kg (difference in mean=+2.38).The quantity of firewood extracted per household was 2789.86kg with the limitations of the above mentioned variables. The total firewood collected by the 272 households in kallarputhur involved in it amounts to 731642.11kg.

Raw spinach, an edible plant species were extracted only by tribal households. The weight of the produce carried by a person per day amounts to 0.67kg (standard error=0.74). Quantity of raw spinach extracted annually by 119 tribal households in the hamlet amounts to 1666 kg.

The quantity of firewood and ntfp extracted annually by the hamlet of kallarputhur are represented by table.2.Firewood collection stands to be the major issue forming 90.94% of the whole and being extracted throughout the year.

Cattle grazing involve daily visits into the forest. A total of 181 livestock were owned by 128 households in the village. The livestock population consists of equal no. of goats and cows. Only 10% of the tribal households were involved in this daily activity. The grazing within the forest limits were mainly by goats. The cows were set free in the farms to graze. The total number of goats entering the forest on a daily basis was 97. The needs of fodder for the number of cattle were meet by daily grazing activities. Hence fodder extraction was not a major activity.

Table 1.1 represents the months of availability of produces.

FIREWOOD	[Shaded]												
GOOSE BERRY		[Shaded]	[Shaded]										
SOAP NUT			[Shaded]										
KADUKAI		[Shaded]	[Shaded]										
TAMARIND	[Shaded]												
PHEONIX PALM	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]							
SPINACH									[Shaded]				
	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	

Table: 1.2: quantity of produces extracted annually by the people of kallarputhur

Forest produces	Extraction in kg/week	No. of weeks of extraction	Extraction in kg/year	Percentage
FIREWOOD	15243	48	731642	90.94
GOOSE BERRY	1875	8	15000	1.86
SOAP NUT	2500	4	10000	1.24
KADUKAI	2500	8	20000	2.49
TAMARIND	2188	12	26250	3.26
SPINACH	139	12	1666	0.21
Total	24444	92.00	804558	100.00

D. Annual income and Forest dependency

Poverty and lack of gainful employment were reasons for people to depend on forest resources for their livelihood. The relation between annual income and the forest dependency of Kallarputhur residents was probed using a chi-square test of independence. The households were categorized into three categories of degree of dependency based on the quantity of forest produces extracted. The annual income categories were clubbed into three to facilitate a 3x3 contingency table. The value of χ^2 amounted to 2.1. Considering 5% significance the value of χ^2 for four degrees of freedom amounts to 9.5. Hence the relation was considered to be statistically significant.

V. DISCUSSION

A. Economic Scenario and forest dependency

Poverty leads people to depend on forest resources for their livelihood. The computation and categorization of annual income attempts to infer from the relation with reference to Kallarputhur. The major occupational activity of the people was their involvement as coolies in the areca nut farms. The census 2001 data of occupational structure of Odanthurai village indicates a high percentage of other's category, indicating the areca nut farm laborers.

The equal composition of tribal and non-tribal population in the lower income categories had indicated dependency on forest resources by non-tribal people (Fig1.4.). The result of the survey suggests that 38% of the forest dependent households were non-tribal. Hence the pressure on the forest was increased by the inflow of non-tribal population.

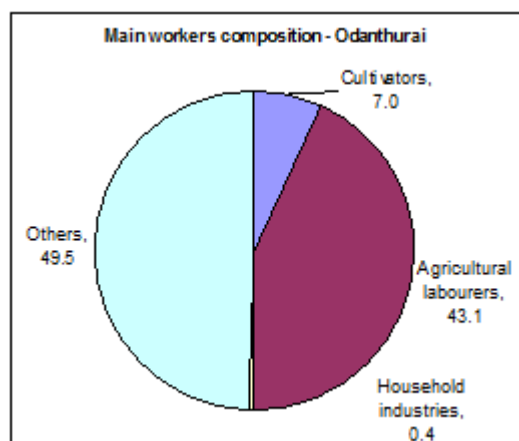


Fig: 1.6 Main workers composition –Odanthurai

Table: 1.3 Quantity of extraction

Quantity of institutionalized extraction(KG) in Metupalayam range					
	Private contractors		SHGs		
	2001-02	2002-03	2003-04	2004-05	2005-06
Produces					
Tamarind	500	2500	0	5000	2000
Soap nut	5400	0	3400	7514	2680
Tall grass	0	11.5	525	0	0
Goose berry	0	500	0	0	0

Source: Metupalayam forest range office

B. Firewood collection and NTFP extraction

The people were dependent on the forest resources mainly for firewood collection, 90.94% of the quantities extracted were firewood. The need for firewood for cooking extends throughout the year. The main routes taken for the collection of firewood into the forests were, along the railway and the river bed towards the east and towards the hill slopes in the north. A mode distance of 2 km was covered by the people on all the trails. The results also reveal collection of firewood from the areca nut farms. 75% of the households engaged in firewood collection were also dependent on the areca nut farms for fuel wood. The areca nut farms are a source of fuel wood to majority of the remaining households.

The minor forest produces extracted in the Metupalayam range of forests are tamarind, soap nut, tall grass and goose berry. The extraction which was done by private contractors until 2003 was later transferred to self-help groups of the indigenous people exclusively. The extraction was leased by the SHGs from the forest range office. It occurs during the months of January and February and the contract period ends by June 30th. The local people were involved in the extraction process for daily wages.

VI. INFERENCES

The institutionalization of ntfp extraction had favored the local people and optimized extraction. The quantities denote lesser percentages of the produces. The extraction of firewood was a major issue. Firewood extraction is a potential future threat to the habitat quality of the corridor, given the increase in pressure on forest resources by increase in population of the hamlet.

A. Solution

Alternate energy provisions for cooking forms an effective solution. Reducing usage of firewood for cooking has the potential of reducing the threat to habitat quality. People's opinion was probed for the various options of the solutions.

Kerosene or ethanol stoves were preferred by 4 of 22 households as they cost the least and occupy less space. Biogas generation in the households was preferred only by 3 households as it involves a lot of time and labor for preparation and maintenance. In 35% of the households both men and women spend long hours a day working as coolies in the areca nut farms. A minimum of four cattle per household are required for sufficient cow dung for household biogas generation. Only three households of the 84 households own cows' possess more than three cattle.

LPG connections received less response. The space requirement for the LPG usage was large. Biogas supply by a local institution involving the people was a preferred solution by 50% of the households and feasible in terms of cost, time and space. People's awareness of the success of a similar initiative in Odanthurai was a contributing factor to the response.

Table: 1.4 Options for alternate energy solutions

Options for solutions(n=22)	No. of HH opted
No firewood collection from forest	0
Kerosene or ethanol stoves	4
Biogas generation in households	3
Biogas supply by local institutions	10
LPG connections	5
Alternate livelihood options combined with energy solutions	0

REFERENCES

1. Soule Gilpin 1991, the theory of wildlife corridor capability.
2. Rosenburg et al 1997, Large-scale impacts of hydroelectric development