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INTEGRATED LAND DEVELOPMENT IN FOREST FRINGE VILLAGES: THE KHUNTI MODEL

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ABSTRACT

Integrated land development model adopted in 10 forest fringe villages in tribal dominated areas of Jharkhand under a UNDP sponsored project has achieved remarkable success in sustainable livelihood promotion and conservation of natural resources, checking migration of rural mass to outside state for employment and disassociating young people from Maoist and naxal activities. The rural folk revived the traditional practice of lac cultivation with scientific and technical support of the Institute to reap substantial benefits in tune of ` 70,000- 90,000 per family annually. Apart from growing lac on its well known host trees such as palash, kusum and ber, initiative has been taken on large scale lac cultivation on new host plant *Flemingia semialta* in farmers' fields. The intervention reduces the gestation period to 1 year and facilitates intensive management for enhanced crop yield.

Key words : Land development, Livelihood, Natural Resources, Conservation, Lac cultivation.

Introduction

Khunti district of Jharkhand is situated at 23°04'19" N and 85°16'49" E in the southern direction from Ranchi. Total area of Khunti is 2467 km² and average density of 215 km². The total forest area of Khunti is spread in approx 900 km² areas. The district has dense forest with sal (*Shorea robusta*), palash (*Butea monosperma*), ber (*Ziziphus mauritiana*), and kusum (*Schliechera oleosa*) species in abundance. Possibly for presence of traditionally lac host tree species the area was rich in lac cultivation in past. However, due to various reasons lac cultivation in the area experienced difficulties and the community gave up its cultivation, gradually losing their livelihood opportunities adversely affecting economic conditions of population. Forest cover has also decreased from 50% to 27% of the total area in the past 50 years. Due to shrinking of the forests and scarcity of minor forest produce a large number of populations shifted to agriculture. But the region has low soil fertility, low water holding capacity, lack of irrigation facilities and lack of knowledge in improved agricultural practices, thus opting mono cropping based on monsoon only. Therefore, the approach of integrated land management was tried in 10 forest fringe villages namely Kudda, Anidih, Jiwari, Rutadih, Kuddapurti, Janumpiri, Kotna, Bari, Guttuhatu and Kitahatu falling under Murhu Block in southern east part of the Khunti district (Fig. 1).

Traditional Systems in the District

Socio-Cultural System

The dominant 'Munda' tribes, one of the major

tribes in Jharkhand, numbering more than half a million, act as the decision makers of these villages. The 'Munda' are supposed to be one of the earliest settlers in the area. Their culture, therefore, manifests some of the oldest tribal traditions in the country (Srivastava, 2007). 'Munda' system occupies a structural middle way between the Indo-Aryan and the Dravidian system (Parkin, 1992).

Land Tenural System

'Khuntkhattidar' land tenural system prevails in the region. 'Khuntkhattidar' means joint ownership of land by the community usually clean the forest and prepare the cultivable land for ensuring their livelihood. It evolved many centuries back when the tribals settled in the areas after clearing forests. In the system joint ownership is restricted to a particular village only i. e. inhabitants of one village have special rights on forests, land and natural resources of concerned village but every 'Khuntkhattidar' village is separate from one another. Further, Chotanagpur Tenancy Act (commonly referred as CNT act) of 1908 provides full land rights (Khuntkhatti) to 'Munda' inhabitants of the area. Despite several amendments from time to time, Government has no right over their land and forests.

Land Resource Scenario

In our resource survey we noticed that available land may be classified in four classes in identified villages (Table 1). In these fringe villages irrigated land is a rarity as substantial area is hilly, rocky unsuitable for any form of agricultural cultivation (Fig.2). Village forests

Adoption of integrated land development model in forest fringe villages revived the practice of lac cultivation giving benefit of ` 70,000 - 90,000 per family annually.

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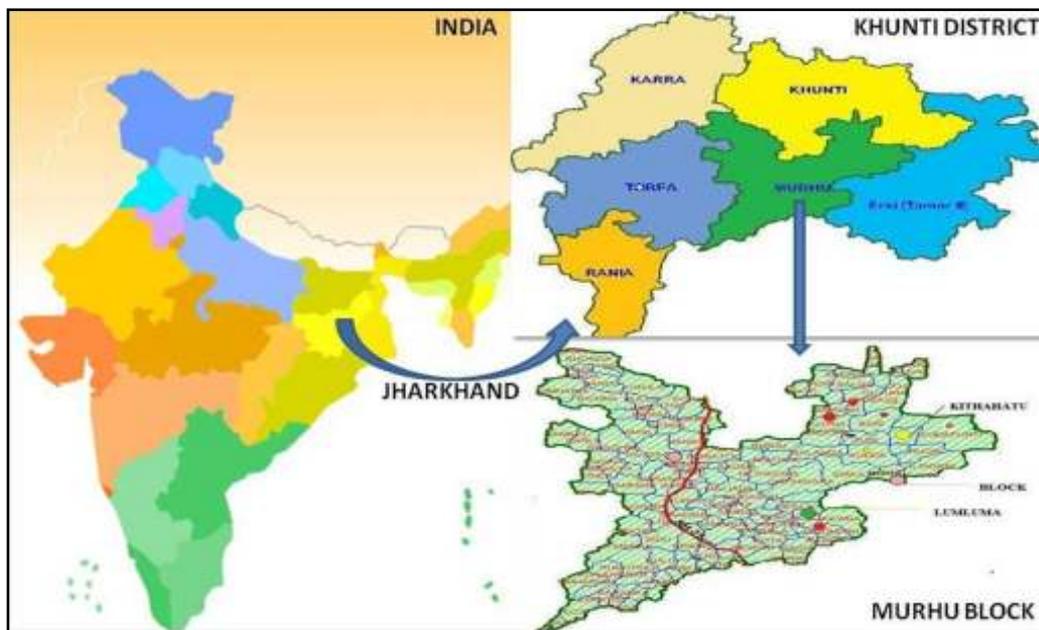


Fig. 1 : Location of identified forest fringe villages

constitute more than 37 % of total land resources. The practice of cropping is similar. The upper land is on elevation where the water doesn't hold. In this type of land cultivation is done during monsoon season. In Don 2 /3 type of land the farmers mainly practice paddy during 'kharif' season. Wheat cultivation is generally practiced on this type of land as Rabi crop. In Don 1 land the farmers cultivate paddy because of the presence of high moisture content. According to the farmers interviewed, during the monsoon season the water from the upper and middle land percolates to this land making the plot suitable for paddy cultivation. From this land the farmers stock grains for their personal consumption and at times of need they sell for serving their financial needs. In the fourth category of Barren land or 'banjar bhoomi' we can find shrubs and weeds making the possibility of cultivation negligible.

Necessity of Integrated Land Development

Land and land resources refer to a delineable area of the earth's terrestrial surface, encompassing all attributes of the biosphere immediately above or below this surface, including those of the near-surface climate,

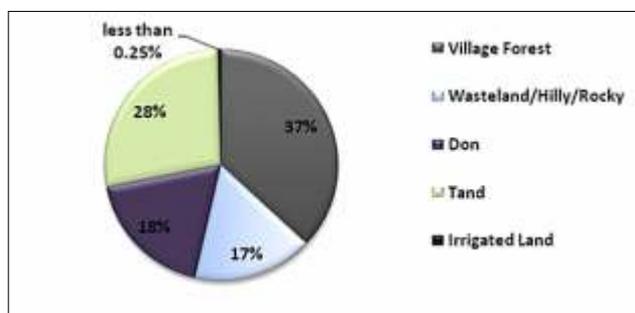


Fig. 2 : Proportion of various classes of land resources in identified villages

the soil and terrain forms, the surface hydrology (including shallow lake, rivers, marshes and swamps), the near-surface sedimentary layers and associated groundwater and geohydrological reserve, the plant and animal populations, the human settlement pattern and physical results of the past and present human activity (FAO/UNEP, 1997). Thus, land should be looked in a holistic perspective for efficient use and management.

Land use is characterized by the arrangements; activities and inputs by people to produce change or maintain a certain land cover type (Di Gregorio and

Table 1 : Various classes of land resources in Khunti district

Sl. No.	Class	In local dialect	Practiced crops
1	Upper land	Tand land	Paddy (Godda variety), Madua, Maize, Sarguja (a type of mustard), tomato, brinjal, Potato
2	Medium land	Don 2 /3	Paddy (Kharif) variety IR 36, 202, gram, vegetable cultivation like of Bottle gourd, Cucumber, Peas, Bitter gourd.
3	Lower land	Don 1	Suitable only for paddy cultivation.
4	Barren land	Banjar	Not cultivated

Jansen, 1998). Land use defined in this way establishes a direct link between land cover and the actions of people in their environment. However, limitations of land resources for providing food and livelihood to ever-increasing population should be understood and taken care with. Based on an assessment of the potential production from available land, and projected population growth in 117 countries in the developing world, FAO concluded that by the year 2000, 64 countries (55%) would not be able to support their populations from land resources alone using production systems based on low inputs (FAO, 1982). Therefore, productivity of land needs to be enhanced which is only possible through integrated land development. The approach was adopted in forest fringe villages in Khunti district where the necessity of implementation of integrated land development was imminent due to small, unirrigated and unproductive agricultural land holdings; loss of biodiversity in natural and village forests as well as sacred groves of the community; lack of perennial water resources; and decline of traditional livelihood opportunities such as lac cultivation and collection of non-timber forest produce. The present model referred as 'Khunti Model' effectively handled all these problems. The data presented here has been collected during 2009-2012. The process and components of the model have been depicted in Fig.3.

Promotion of Chuan and Small Water Resources

Due to topographical and climatic conditions, the forest fringe villages have scarcity of water resources for continual agriculture and personal consumption. Thus, it was thought to promote traditional small water resources such as 'Chuan' present in the villages but not in optimum use. 'Chuan' is a traditional method adopted for water conservation. The water in chuan is stored from underground seepage of water from rocks. The promotion sites were identified by the villagers and accordingly constructed. 18 units of 'Chuan' were improved to make them functional for the benefit of total 300 families. Multi-seasonal cropping has become possible in area in vicinity of the constructed 'Chuans'. Around 50-60 acres land has ensure irrigation with the intervention. Earlier only paddy could be cultivated in these areas but with improvement of 'Chuans' now the famers are cultivating seasonal vegetables adopting multi-cropping system. Income from cultivation prior to intervention in the villages was ` 174920 which registered an increase of 12 times to reach at ` 2102320 (Table 2).

The community adopted a unique mechanism for allotting land for cultivation around 'Chuans'. The person on whose land (near to that) 'Chuan' has been

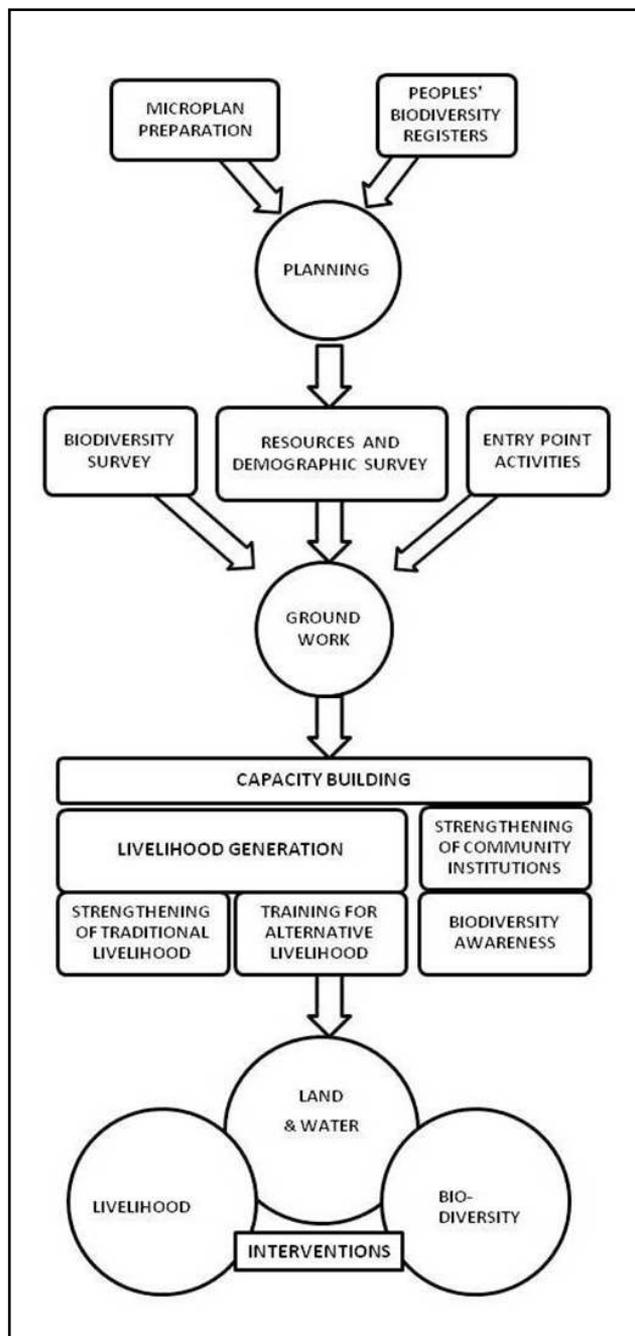


Fig. 3 : Elements and implementation process of *khunti* ILD model

constructed/maintained will be owner for raising the principal rain-fed crop but rest of the time the land ownership will be with the community which allots it to the needy group member for cropping getting irrigation from the 'Chuan'. This remarkable arrangement resulted not only optimal yield from the land but also in maximizing livelihood opportunities for most of the members (Fig. 4).

Development of Sacred Groves

Sarna-sthal or scared groves are important constituents of cultural milieu of the 'Munda's (Table 3). Sacred groves are segments 'of landscape, containing

Table 2 : Agricultural income pre and post chuan interventions

Sl. No	Village	Chuan Number	Chuan Irrigated Land (acres)	Pre Chuan		Post Chuan	
				Cropping	Income (₹)	Cropping	Income (₹)
1	Bari	02	7.00	Paddy	22,500	Paddy and vegetables	3,19,025
2	Kotna	01	3.65	Paddy and maize	16,425	Paddy and vegetables	1,76,525
3	Jiwri	01	4.04	Paddy	18,180	Paddy and vegetables	4,00,380
4	Kitahatu	01	4.50	Paddy	20,250	Paddy and vegetables	71,700
5	Gutuhatu	01	2.59	Paddy and Surguja	11,565	Paddy and vegetables	2,33,790
6	Janumpiri	01	3.00	Paddy, Maize, Surguja	17,550	Paddy and vegetables	4,43,900
7	Rutadih (Lumluma)	01	5.30	Paddy, Maize, Surguja	28,850	Paddy and vegetables	1,11,350
8	Kudda	01	3.00	Paddy	21,250	Paddy and vegetables	2,20,650
9	Kudapurti	01	4	Paddy	18,350	Paddy and vegetables	1,25,000
Total		10	37.04		1,74,920		21,02,320

vegetation and other forms of life and geographical features that are delimited and protected by human societies under the belief that to keep them in a relatively undisturbed state is expressive of an important relationship of humans with the divine or with nature (Hughes and Chandran, 1998). According to Kosambi (1962) the institution in India is very ancient and dates back to the pre-agrarian hunting-gathering stage, before humans had settled down to raise livestock or till the land.

It is believed that when 'Munda' ancestors came to Chotanagpur plateau they left a patch of forest uncleared with the belief that the Gods would reside in this patch of forest. Therefore, cutting 'Sarna' tree (sal) or other trees around it is prohibited (Srivastava, 2007). Every village has a sacred grove where trees/herbs of religio-cultural importance are maintained. It is said that earlier whenever they migrated to another village, they carried with them seedlings of those important species and planted in the new village and created *Sarna sthal*. They worship different tree species in different occasions. So each target villages has sacred groves which used to be storehouse of unique biodiversity and thus great conservation value. However, with the passage of time these valuable resources got considerably depleted of tree species in want of proper management. In the present study we laid emphasis on rejuvenation of sacred groves in the identified villages. The idea was to scientific silvicultural management of existing vegetation, undertake new plantation in the gaps, and assisted

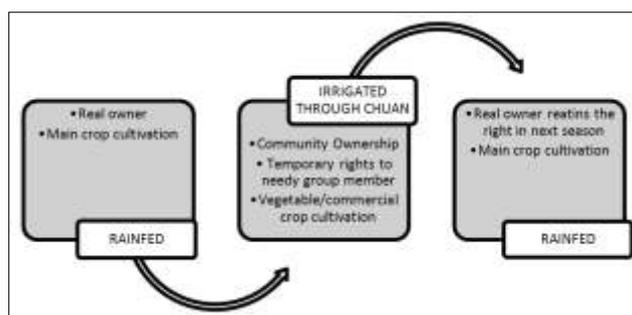


Fig. 4: Pattern of land ownership in lands around chuans in identified villages.

natural regeneration (ANR). This was an in fact an attempt for *in-situ* biodiversity conservation involving community in sacred groves. In all 29.47 acres land area has been developed. Plantation of sal trees, which are a symbol of 'Munda' sacred groves and other species of religious importance, were done (Table 4).

ANR activities have been done on a large scale in soso buru, Janumpiri where large number of species were present (Herbs-30; Shrubs- 20; Trees- 49 and Climbers-29). The tribals of the area also use different plant parts for medicine in addition to religious importance. The area is also rich in regeneration of sal. ANR was done for singling out the species, removal dead trees and removal of unwanted climbers.

Development of Village Forests

In the village forest there were certain areas where good natural regeneration of important species was recorded. However, due to biotic factors, fire hazard and

Table 3 : Details of different types of sacred groves present in the identified villages

Sl. No	Name	Meaning	Time/Season of Worship	Worship of the particular	Manner of Worship
1.	Baa Zaire	Worship place of new flowers on Sal trees.	February-March (Magh and Falgun)	Worship of new flowers of Sal/ Sakhua trees.	Rituals performed by the village <i>Pahan</i> . Villagers wear new dress at start of new work e.g. agriculture.
2.	Zilu Zaire	Worship after hunting during Holi festival.	March-April (Falgun and Chaitra)	Worship of flesh of the hunted wild animals.	Prayers for blessings during hunting time.
3.	Buru Zaire	Worship place of god of hills.	December	Worship of Red/coloured fowl or goat.	Rituals performed in memory of the ancestors.
4.	Madda Buru	Worship place for repentance.	No fixed time or season	Worship of black sheep /goat	Rituals when someone cuts tree from sacred grove, violator repents by offering.
5.	Ekir Bonga	Water resource; the wife of Burubonga	Water is taken for worship in sacred groves or elsewhere.	Water	Village <i>Pahan</i> performs rituals to protect village from any epidemic, disaster or disease. It bounds the village boundary.
6.	Debi Bonga	Abode of goddess of good health in "Gulaichi" tree at village boundary;.	February- March (Magh and Phagun)	Beetle leaf, Supari, water and rice beer. As well as Red cloth and white cloth.	Village <i>Pahan</i> performs rituals against evil spirit / power, to stop the severe disease in the village.
7.	Desha-wali	Like Madda Buru but separate places	No fixed time or season	Worship of black sheep /goat	Similar to that in case of Madda Buru.

various other factors natural regeneration was not able to convert into successful tree growth and mother plants were depleting. This situation was precarious for several important species to become extinct in time to come. In these areas aided natural regeneration (ANR) which is a system of management through which the unwanted species are removed for facilitating regeneration of natural desired species was adopted with the involvement of the community. ANR may be defined as human intervention of protection, support and conservation of natural tree seedlings in forested areas. Weeding, climber cutting and removal of dead diseased plant in addition to caring of useful species was undertaken to develop 28.5 acres of land area through ANR.

In *Khuntkhatti* land management system 'Munda' tribe, the ownerships of land lie with the community and vast tract of community land was lying degraded. Community was convinced to raise plantations to cater its day to day need for timber, firewood, NTFP requirements and to relieve pressure on natural forests.

Species like *Gmelina arborea*, *Tectona grandis*, *Pongamia pinnata*, *Semecarpus anacardium* and *Buchanania lanzan* as decided by the community were planted. The community was encouraged to save and protect their village forest and also to promote the forest and species for increasing the biodiversity. In total 22.27 acres land area has been developed as village forest, in which more than 6500 seedlings of tree species (Table 5) were planted.

Protection through Jungle Bachao Samiti

Mobilization of 'Jungle Bachao Samitis' (JBS) has been a significant achievement under the intervention. It was ensured that Forest protection committees conduct monthly meeting and the decisions or the resolutions passed in these meeting are again read out during the proceedings of 'Gram Sabha'. JBS have formed rules against illegal cutting of trees and if anyone found guilty is subjected for penalty of minimum ` 200/- per tree. Forest protection committees restrict free cattle grazing on the area which has been marked for protection. The structure of the JBS is strong for carrying out and taking

Table 4 : Activities undertaken for development of sacred groves

Sl.No	Village Name	Area (Acre)	Number and species planted
1.	Bari	1.50	250 sal (<i>Shorea robusta</i>) and 40 Bhelwa (<i>Semecarpus anacardium</i>)
2.	Kitahatu	2.60	280 sal (<i>Shorea robusta</i>) and 170 Bhelwa(<i>S.anacardium</i>)
3.	Jewri	1.55	180 sal (<i>Shorea robusta</i>)
4.	Gutuhatu	1.15	64 sal (<i>Shorea robusta</i>)
5.	Janumpiri	22.67	350 sal (<i>Shorea robusta</i>)
	Total	29.47	924 (<i>Shorea robusta</i>) and 210 Bhelwa (<i>S. anacardium</i>)

Table 5 : Activities undertaken for development of sacred groves

S. No.	Village	Area (ha)	Number and species planted
1	Bari	10	300 total: Gamhar (<i>Gmelina arborea</i>)
2	Kotna		755 total: Chiraunji(<i>Buchnanian lanzan</i>)-250, Mahagony (<i>Swietenia mahagony</i>)-100, Keond (<i>Diospyros melanoxylon</i>)-250, Kusum (<i>Schleichera oleosa</i>) -100, and Soobabul (<i>Leucaena leucocephala</i>)-55.
3	Kitahatu		500 total: Sagwan (<i>Tectona grandis</i>)-300, Mahgony(<i>S. mahagony</i>)-50, and Gamhar(<i>Gmelina arborea</i>)-150.
4	Jewri		205 total: Shisam (<i>Dalbergia sissoo</i>)-155 and Sal-(<i>Shorea robusta</i>)50.
5	Gutuhatu		3092 total: Sagwan(<i>T.grandis</i>)-800, Mahgony(<i>S.mahagony</i>)-100, Gamhar(<i>G. arborea</i>)-2000, Ber(<i>Z. mauritiana</i>)-50, Sal (<i>S. robusta</i>) -100 and Neem(<i>Azadirachta indica</i>)-42.
6	Rutadih		50 Total: Sal(<i>S. robusta</i>)-20 and Gamhar(<i>G. arborea</i>)-30.
7	Janumpiri		1850 total: Sagwan(<i>T.grandis</i>)-400, Mahgony(<i>S. mahagony</i>)-100, Chiraunji (<i>Buchnanian lanzan</i>)-400, Gamhar(<i>G. arborea</i>)-850, Kaju (<i>Anacardium occidentale</i>)-50 and Bhelwa(<i>S. anacardium</i>)-50.
TOTAL		10	6752

decisions on the protection of forest. At the same time the community gives its *shramdan* (work contribution) as per the requirements like fencing of fruit giving saplings or plants catering high medicinal values.

Livelihood Promotion Activities

Provision of seed money for livelihood support

A total amount of ₹ 3,60,000 has been distributed amongst 144 families to support various types of livelihood activities such as vegetable cultivation, paddy, grocery, cattle rearing, lac cultivation, etc. (Fig. 5). A strong community sentiment and self regulation ensured that more than 65 families returned back seed money for revolving purpose as soon as they attained profit.

Livelihood activities undertaken with the seed money resulted in the income generation of ₹ 1282546 at the end of 2 years with a cost benefit ratio of 1: 4.5. Increase in family economic status by 30% to 40% was registered. Adoption of alternative livelihood technologies and methods was promoted. Provision of seed money transformed the cultivation pattern in the identified villages with vegetable cultivation reaping significant economic gains. A cost benefit analysis of various livelihood activities undertaken with the seed money has been provided in Table 6. Khunti has never been a traditional vegetable growing region but now the scenario has changed completely and farmers are growing diversified vegetable crops. Even crops like water melon which are not reported to be cultivated in Jharkhand have been successfully cultivated by the farmers.

Revival of Lac Cultivation

Lac, a natural polymer (resin) is produced by a tiny insect, *Kerria lacca* (Kerr), which is purposely cultured on shoots of several species of trees, mainly palash (*Butea monosperma*), kusum (*Schleichera oleosa*) and ber (*Ziziphus mauritiana*). This agricultural profession of lac

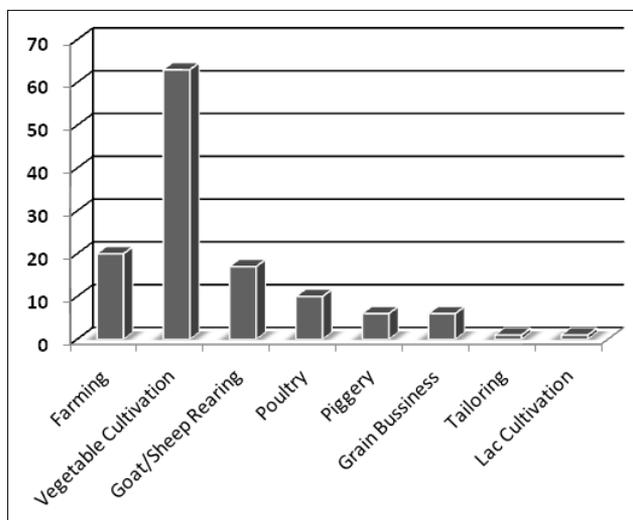


Fig. 5 : Utilization of seed money by the households

cultivation is a subsidiary source of income for a large number of farmers mainly in Jharkhand, Chhattisgarh, West Bengal, Odisha, North-East states and other parts of the country. India, which is the highest producer of lac, contributes around 60% of the total world requirement. The country exports around 80-90% of its production. Jharkhand is the 'Lac State of India' which alone contributes about 59% of the national production (IFP, 2011-12; www.jharkhand.gov.in).

Lac cultivation is an important source of income for livelihood of the forest and sub-forest dwellers in different states. According to Rao and Singh (1990) cultivation of lac is carried out by three to four million Adivasis (tribals) in many Indian states. Khunti has traditionally been a major lac producing region in the country. Availability of large number of traditional lac hosts plants such as palash, ber and kusum is plentiful in the area (Table 7) and the rural folk are aware of the basic techniques of lac culture. However, a down ward trend has been witnessed in lac cultivation during last few decades mainly due to non-availability of brood lac on

Table 6 : Cost benefit analysis of livelihood activities undertaken with seed money

S. No.	Livelihood activity	Cost benefit ratio
1	Farming	1:4.6
2	Vegetable cultivation	1:4.2
3	Goat/Sheep rearing	1:3.3
4	Poultry	1:2.6
5	Piggery	1:3.0
6	Grain business	1:2.7
7	Tailoring	1:2.9
8	Lac Cultivation	1:6.0

sustained basis, loss of number and vigour of lac host plants, rising temperature and unscientific cultivation practices. We tried to revive lac cultivation in the target fringe villages to make them self dependent with establishment of community brood lac farms and introduction of scientific cultivation of lac. Initially the villagers were not very enthusiastic about lac cultivation but later they were convinced when informed about the benefits which could be attained by the practice. In a planned manner capacity building, master trainings at the village level and field training and demonstration to the villagers were undertaken.

A humble beginning was made by organization of a 2 days training programme at Bari village on May, 2009 with 48 participants followed by selection of sites at Bari village near '*Sarna sthal*' (Sacred Groves) on February, 2010 when 11 farmers volunteered to provide their Palas tree for the establishment of Broodlac Farm at Bari. Pruning was done in 410 Plash in the month of April 2010 and 200 kg of broodlac (*Rangeeni* crop) was inoculated in October, 2010. The inoculated trees were maintained strictly adhering to the calendar of scientific lac cultivation.

'*Phunki*' (scrapped lac) removal was done in November, 2010 and 37.5 kg scrapped lac was collected and sold in the local market by an amount of ` 7500. A broodlac management fund was established with this initial earning at Bari village. Partial harvesting was done during July 2011 to obtain 529 kg of total broodlac which was inoculated in 579 new Palas tree at Bari village.

Table 7 : Potential lac host plants available in the identified villages

Sl. No.	Village	Kusum	Palash	Ber
1	Bari	90	27000	1600
2	Rutadih	20	900	430
3	Ziwri	76	30000	6000
4	Gutuhatu	150	10000	1260
5	Janumpirir	90	3000	1000
6	Kudapurty	175	30000	6000
7	Kudda	30	3900	5000
8	Kitahatu	10	20000	3000
9	Kotna	40	10000	2500
10	Anirdih	10	10000	500

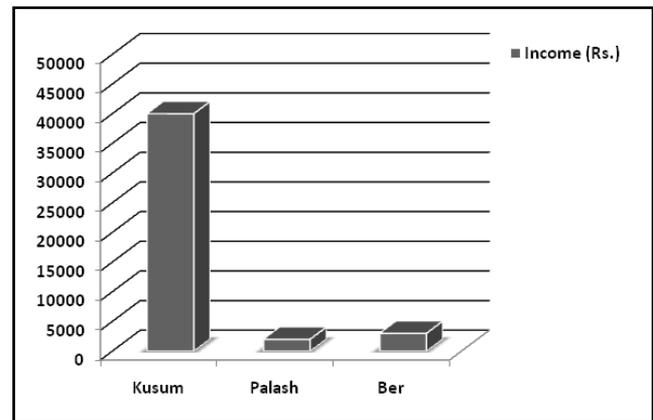


Fig. 6 : Income generation from a single lac host tree

Broodlac was provided free of cost among 58 families of Bari village @ 8 kg/per family (total 464 kg) which was inoculated in 348 Palas trees individually by the families. Another 50 kg broodlac was sold @ ` 70/kg to nearby targeted villages viz., Kotna (20 kg for inoculation in 80 trees), Gutuhatu (20 kg for inoculation in 25 trees) and Bari (10 kg for inoculation in 20 trees). Complete harvesting was done in October, 2011 to get 600 kg of broodlac which was supplied to Jiwri village for the establishment of community broodlac farm by inoculating in 1100 new palas tree at Jiwri village in November, 2011. Here '*phunki*' removal was done during December, 2011 obtaining 37 kg of scrapped lac which was sold in the local market to earn ` 11500. This money was employed in establishment of Broodlac Management Fund at Jiwri Village. Again partial harvesting was carried out in July, 2012 to collect 140 kg of broodlac from 800 palas trees which were inoculated in 500 new palas trees at Jiwri village. Complete harvesting scheduled in September–October, 2012 is expected to yield approximately 800-900 kg which will be a substantial earnings for the involved families.

Economic analysis of lac cultivation on palash, ber and kusum reveals significant gains by adoption of scientific techniques. Lac cultivation on a single host tree can reap an economic gain of ` 2000 to 40000 depending on the species selected (Fig.6). Scientific cultivation of lac at a single village i.e. Bari resulted in average income of 58 families engaged ` 64300 in two years of intervention (Table 8).

Still lac culture with traditional hosts is tedious involving management of trees of big dimensions which are usually scattered in distribution. Therefore, introduction of new alternative host plant (*Flemingia semialata*) which could be managed in intensive cultivation on a short rotation was done in Ziwri. The farmers were initiated to plant a total of 16500 plants in 7 acres in July, 2011. The plants are ready for being

inoculated with lac. 30,000 plants are being planted in two target villages namely Kitahatu and Ziwri the monsoon of 2012 to replicate the success. Intensive cultivation of *F. semialata* has been well received particularly by youths (21-30 years age class) while elder population preferred lac cultivation of traditional tree hosts. The future of *Flemingia* appears promising with reported earnings of ₹ 47500 per acre.

Overall the intervention has resulted in reactivation, recharge and effective use of traditional lac host trees (palash, kusum and ber) and introduction of new fast growing early utilizable host plant i. e. *Flemingia semialata*. Strengthened and activated *Jungle Bachao Samitis* played a crucial role in ensuring security of inoculated lac host trees as well as biodiversity in the region. Further firewood for domestic use collected after pruning lead to reduced tree cutting for fuel purpose by the community. Thus, it may be said that there has been a revival of lac cultivation in the Khunti region with scientific interventions and community participation (Table 9).

Impact of Integrated Land Development

Integrated approach of land development has resulted in substantial economic benefits and sustainable livelihood for a number of families in fringe villages. The life has changed for the people like Etwa 'Munda' of Bari village, who used to earn ₹ 25 per day along with one meal (lunch) working as a daily labourer in the village, around 90 days a year earning a meager ₹ 2250 annually. In the summer months, he has to come Khunti town, 13 Km away to work as a labourer which could provide him work for around 30 days with daily earnings of ₹ 70 and thus ₹ 2100 in total. To meet other expenses Etwa used to cut wood from the jungle and sell twice a week. By selling 5 'bojhas' (1 bojha is around 15 Kg

of cut wood of 2 ft length and of 2-3 inch diameter, sold @ ₹ 20 a bojha) a week and earned ₹ 100 to earn additionally ₹ 400 - ₹ 500 per month. Etwa was provided with seed money of ₹ 2500 from the project fund for livelihood promotion which he utilised for purchase of seeds and amendments for tomato cultivation. He earned approx. ₹ 10000 from tomato cultivation during summers near a *Chuan* constructed under the intervention of land and water management under the project. According to 'Munda', he earns around ₹ 15000 - 20000 now. He has purchased a two wheeler from his earnings to carry vegetables to the market saving lots of money on local transportation.

It was end of migration to outside the state for livelihood for 35 years old Dero 'Munda' of Bari village. Dero has to move as far as Nagaland to work in a road construction. He was discarded by the villagers for not giving wedding feast (a rituals in which the groom organizes a grand feast for the villagers for getting recognition of the marriage) and on the birth of his three children due to poverty. He was involved with the project activities and inspired to attend the field training on improved methods of lac cultivation. After attaining the training and with the help of the seed money of ₹ 2500 provided to him for the livelihood generation, he procured broodlac and applied the improved technique for cultivation of lac. Now, he earns ₹ 80,000 through lac cultivation from two Kusum trees and five Ber trees and has become an icon among the villagers in terms of lac cultivation for the nearby areas. Recently, he gave feast to the community members to celebrate his achievements and regaining the lost pride. Women have also actively participated and got benefitted. Sunita Mundu, a 24 years old undergraduate student from Jiwri village earned ₹ 33000 (₹ 18000 from lac cultivation from 35 Ber trees and ₹ 15000 from the vegetable cultivation) within

Table 8 : Economic analysis of lac cultivation at Bari village in two year duration

S. No.	Activities/events	Quantity (kg)	Families Involved	Trees under cultivation	Input (₹)	Output (₹)
1	Initial Broodlac provided for inoculation	200	11	410	18000	-
2	Broodlac produced after 1 year	1129	11	410	-	903200
3	Broodlac utilized for further cultivation on their own trees	464	58	1200	371200	-
4	Broodlac loaned to another adjacent village- Jiwri	600	20	-	480000	-
5	Income from phunki removal	84	58	1200	-	33600
6	Lac produced next year at Bari	3248	58	1200	-	2598400
7	Broodlac sold	162	58	1200	-	129600
8	Self utilization for further cultivation	650	58	1200	520000	-
9	Income from scrap at Bari	2436	58	1200	-	974400
10	Broodlac returned by Jiwri village	600	20	-	-	480000
11	Labour cost*	-	58	1200	-	-
Total					1389200	5119200

*The forest fringe villagers conducted the activities themselves. Thus, labour cost has not been included.

Table 9 : Details of lac cultivation in forest fringe villages

Sl. No.	Village	Traditional Hosts (number of trees)			New alternate host (<i>Flemingia semialata</i>)	
		Kusum	Palash	Ber	Area (acre)	Number
1	Bari	1900	400	15	-	-
2	Jiwri	1000	-	-	5	16000
3	Janumpiri	120	15	-	3	9000
4	Kitahatu	90	-	-	6	16000
5	Gutuhatu	100	20	60	-	-
6	Kotna	90	-	-	2	5500
Total		3300	435	75	16	46500

six months. She set an example by adopting the agro-lac models (agriculture along with lac on ber tree) for the others and motivated the women of the village.

Integrated land development brought an aura of hope and opportunity in the insurgency stricken (naxal and maoist) region of Khunti. Various interventions attracted youth which may have otherwise got involved in activities detrimental to the society. Active involvement of youth and women was in fact the key point of success of the project activities. The best thing was remarkable reduction of migration to other states for the sake of livelihood.

Community bonding was further strengthened by sharing of land for community farming and income generation and support to landless families. A unique pattern of land ownership moving from individual for rain-fed condition to communal in irrigated condition due to improvement of 'chuan' has been exemplary and effective in providing livelihood to larger group. A significant exhibition of strong community coordination and control was self regulation of seed money to establish revolving fund maximizing benefit to more and more members. Against the general tendency to consider any type of financial support as a permanent and non-returnable, most of the members of tribal community in forest fringe villages returned the seed money as soon as they got economic gains from the promised activity for which it was provided.

The approach also delivered on ecological and biodiversity front. 'Chuans' construction ensured

optimum use of agricultural land, leading to conservation based use of community land and reduction of tree felling/firewood collection from natural forests. Agricultural biodiversity was also promoted with incorporation of a number of vegetable and other introduced crops. Biodiversity of village forests was enhanced by ANR, improvement and conservation measures. Community based restoration and maintenance of indigenous species of sacred groves not only rejuvenated these cultural resources but also helped winning the faith of simple tribal population. Virtually the dependency upon forest for livelihood reduced leading to conservation of biodiversity. The role of 'Jungle Bachao Samitis' has also been phenomenal proving once again that social fencing is the best possible protection for natural forests and loss of biodiversity.

Conclusions

In conclusion, significant improvement in the income and livelihood opportunities for forest fringe villagers has been achieved through integrated land development model in 10 forest fringe villages of Khunti district. The region has witnessed revival of lac cultivation with scientific interventions and new fast growing host plants. Positive effect of community-based natural resources management has also resulted in improvement of biodiversity. The model resulted in strengthening of community bonding and institutions, checking migration of rural mass to outside state for employment and disassociating young people from Maoist and naxal activities.

वन सीमान्त गाँवों में एकीकृत भूमि विकास : खून्टी मॉडल

वी.के. बहुगुणा, आर. दास और संजय सिंह

सारांश

संयुक्त राष्ट्र विकास कार्यक्रम प्रायोजित परियोजना के तहत झारखण्ड के जनजातीय प्रधान क्षेत्रों में 10 वन सीमान्त गाँवों में अपनाए गए एकीकृत भूमि विकास मॉडल ने प्राकृतिक संसाधनों के संरक्षण और पोषणीय आजीविका प्रोत्साहन, रोजगार के लिए राज्य से बाहर ग्रामीण जन समूह के प्रवासन के नियंत्रण और मावोवादी एवं नक्सल कार्यकलापों से युवा लोगों को अलग रखने में उल्लेखनीय सफलता हासिल की है। प्रति परिवार सालाना 70,000 से 90,000 तक पर्याप्त लाभ कमाने के लिए संस्थान के वैज्ञानिक एवं तकनीकी सहयोग से ग्रामीण जन समूह में लाख खेती की पारंपरिक पद्धति को पुनरुज्जीवित किया है। इसके अच्छी तरह से ज्ञात परपोषी वृक्षों जैसे पलास, कुसुम और बेर पर लाख उगाने के अलावा नए किसानों के खेतों

में नए परपोषी पादप फ्लेमिन्जिया सेमियाल्टा पर बड़े पैमाने पर लाख खेती की शुरूआत की गई है। हस्तक्षेप गर्भावधि को 1 साल तक कम करता है और वर्धित फसल उत्पादन के लिए गहन प्रबंधन में मदद करता है।

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