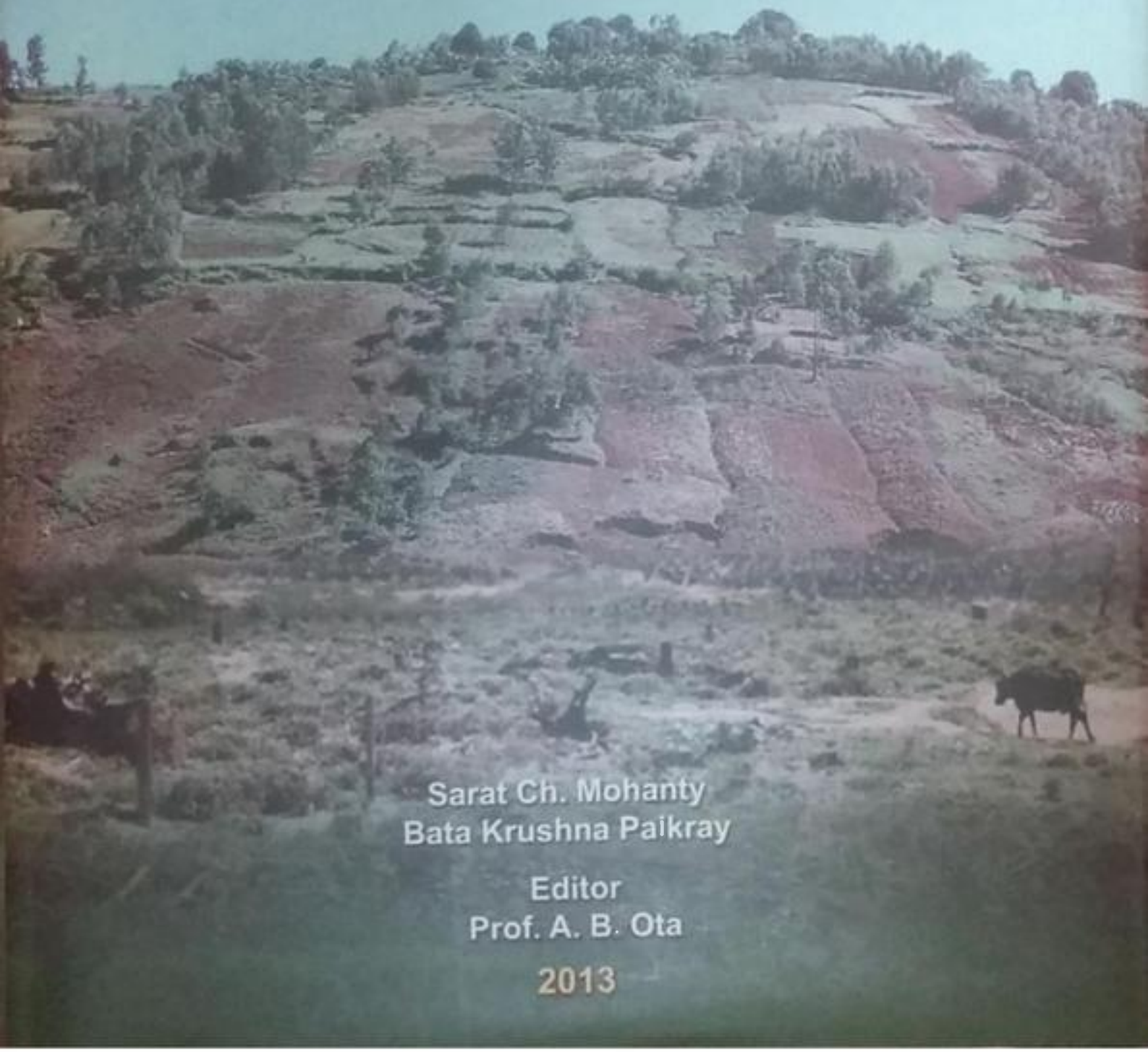
EFFECTS OF DEFORESTATION ON TRIBES OF ODISHA

THE CASE OF LANJIA SAORA & THE JUANG



Sarat Ch. Mohanty
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PREFACE

Since time immemorial, the traditional livelihood system of tribal people known as *adivasis* in India has been based on land and forest. Their very survival critically depended on land and forest resources. For historical and ecological reasons, most tribal people inhabit the forest and highly inaccessible regions of the state. These forest dwelling tribes have subsisted on shifting cultivation, hunting and gathering of edible and non-edible forest produce. Such a system was rendered sustainable by a level and pattern of utilisation of land and forest resources, which ensured their self-generating capacity. Such a livelihood system also provided for a nutritionally balanced food consumption basket. Thus, it can be said that the tribals were perhaps the earliest 'social ecologists' whose economic existence were rooted in both subsistence and conservation ethics.

Based on customary, usufructuary rights of tribals over land and forests, their traditional livelihood system, in social terms, was an 'extensive' system of production in which the 'common pool' nature of resources established their customary rights and prevented the intensification of production, in the interest of conserving and sustaining the durable productivity of the natural livelihood resources. Thus firmly rooted in a system of customary rights over land and forests the tribals' subsistence were dependable and sustainable when the natural resources were abundant and their populations were small.

The customary rights and commands of tribal people over their livelihood resources i.e., land and forest and their territorial autonomy and sovereignty increasingly came into conflict with the forces of 'modernisation', pushed in by the 'outsiders' and external agencies. Undermining the tribal traditional livelihood system as 'underutilized', 'wasteful' and 'inefficient', these external agencies including the state created a policy and legal framework for gaining control over the precious natural resources of the tribals. The remote tribal territories were trespassed and their land and forests became the property of the state since the time of colonial rule. This alien system threatened to under-value the viability and sustainability of tribal's livelihood base.

Before the colonial rule, most of the tribal areas were autonomous. During the British period the inclusion of tribal areas in state administration and commercial exploitation of their valuable natural resources was often violently contested by the tribals. Much of this resistance was put down with a heavy hand. Subsequently,

both the British and Princely States increased their administrative control over tribal areas and allowed the non-tribals who carried out settled cultivation, to settle down in tribal territories. The major reason for encouraging the settlement of upper caste cultivators in lands customarily held by the tribals was to increase land revenue. This again caused tribal agitations in different regions which again were brutally suppressed by the then rulers. This led to over-exploitation of natural resources of the tribal areas and marginalization of tribals who were self-sufficient till that time.

Tribal communities live close to the nature. Their association with the forest goes back to the hoary past. Therefore they are known to others as forest dwellers. Being forest dwelling folks they have developed a symbiotic relationship with the forest. They depend heavily on the forest for their livelihood, shelter, occupation and employment. Their folklore, religion and worldview are woven round the forest. This has been reflected in their economy, religion, polity and social institutions, which cannot be understood without understanding various aspects of the forest surrounding them.

Until the intervention of the foreign rulers, tribal people asserted themselves as the owners of the forest resources that surround them. Their emotional attachment to the forest resources as a source of food and other necessities did not change much until Independence. They were more forest- friendly and never over-exploited forest resources for personal gains. Almost all the tribal communities in Odisha have evolved various forms of social sanctions related to their forest based subsistence activities to conserve their forest resources and prevent its over-exploitation. They have taboos and restrictions regarding undertaking or not undertaking certain forest-related activities in different times, collecting and consuming certain products, when and how to gather and consume forest produce, and performance of rituals on a community basis before the first eating of forest food items. They have developed their customary laws relating to management of their forest resources which have become the guiding force for binding them closely with the forest

This age old harmony of the tribals with nature has been breached since the 19th century and particularly from the time of colonial administration. The major reasons are rapid growth of population, urbanization, mining and industrialization, development projects and especially the commercial exploitation of forest resources based upon the policy of treating the forests as national wealth and continuance of the policy even after independence. This has started a trend of massive deforestation and its consequent ecological hazards on one hand and erosion of age-old customary

rights of the tribal people and their nature of dependency and relationship with the forest on the other making them the worst victims of deforestation. Because of the consequent limitations imposed on their traditional rights, the forest dwellers have been alienated from their life support system with which they had a symbiotic relationship. The tribes of Odisha are no exception to it.

Though Odisha is comparatively rich in forest resources, the standard of living of its people as a whole is quite low. Among them a vast majority of the tribals who are predominantly forest dwellers are socially, economically and educationally backward and relatively underexposed to the outside world. They live in clusters of villages mainly in the remote hilly areas, many of them primarily being dependent on shifting cultivation and minor forest produce (MFP). In other words, they depend on the forests for their very survival. Deforestation in and around their natural habitat and its far-reaching consequences has subjected them to untold miseries and sufferings.

The impact of massive deforestation is visible in the way of life of tribal people, and can be categorized as environmental effects, social effects and economic effects. The environmental effects of deforestation manifests in forms of soil erosion due to inadequate tree cover, drought due to loss of ground water storage, floods due to run off water, and landslides due to the denudation of hills. The social effects of deforestation restrict tribal people's access to the forest and affect their magico-religious beliefs and practices, lifecycle rituals, value system, customs, traditions and habits. Similarly, the economic effects of deforestation have squeezed the traditional livelihood resources of tribal people, which were providing them with food and economic security for ages.

Besides this, the growth of the tribal population, have put more pressures on the forest resources. Added to this, commercial exploitation of the forest resources, conversion of tribal rights into concessions through the National Forest Policy, 1952, indiscriminate use of forest resources by middlemen and traders, and lack of interest on the part of the government in regenerating forest resources have affected the natural and only livelihood base of the forest dwellers.

With this backdrop, SCSTRTI undertook an empirical study to assess the effects of deforestation among two Particularly Vulnerable Tribal Groups (PTGs) i.e., the Lanjia Saora of Puttasing of southern Odisha and the Juang -the autochthones of Gonasika hills of Keonjhar district in northern Odisha who live in a simple society and inhabit hilly areas located in the remote forest areas in a state of semi-isolation and thrive upon a subsistence economy based on land and forest. Under this

exploratory study one hundred households in 12 selected Lanjia Saora settlements located in Puttasing area of Rayagada district and an equal number of households in 10 Juang settlements in Gonasika area of Keonjhar district has been covered. The qualitative and quantitative primary data and relevant secondary data has been compared, analysed and drafted to bring out this research literature. In its last chapter the issue has been highlighted along with some suggestions with the emphasis that Considering the need of the time, present as well as future, the interface of forestry with development has to undergo metamorphosis. In the emerging scenario the conservation orientation has to yield ground to development orientation and community forestry has to be accorded a fairly high priority. Forests and tribals belonged to each other. With appropriate reorientation, they can be inducted into a more constructive role vis-à-vis the forest and relied upon for its conservation and growth. By building a sound rapport between foresters and tribals the task of conservation, protection and development of forests will be easier. In fact, the forest should be regarded as truly a public resource and not as a mere revenue earner for the state.

Shri Sarat Ch. Mohanty, working as a Research Officer at the time of this research study who have retired as Joint Director of SCSTRTI and now re-employed as O.S.D. (Research) and *Shri Bata Krushna Paikray* working as a Statistical Assistant at the time of this research study and have retired as a Research Assistant of SCSTRTI have carried this research project on their shoulders. They have taken all the pains for preparation of all the social research tools such as schedules, interview guides, collected primary data in both the remote tribal areas, processed and analyzed the primary and secondary data and drafted the research report. Shri Mohanty has worked hard to bring the report to a book format for publication for which I have done the editing work. I am extremely thankful to Shri Mohanty and Shri Paikray for their sincerity and dedication to produce this work.

I hope learned researchers, academicians, administrators, policy makers, environmentalists and all interested persons will find this work useful.

31st December, 2012
Bhubaneswar

Prof (Dr) A.B. Ota, IAS
DIRECTOR, SCSTRTI

INTRODUCTION

Deforestation, today a serious matter of worldwide concern, is precipitated by a situation of over-exploitation of natural resources. Large tracts of moist tropical vegetations are disappearing fast from the earth's surface day by day. Without caring for the mounting natural disasters resulting out of the massive assault on nature, the world today is sinking fast towards the "state of baldness". There is an old Thai saying; "experience is a comb which nature gives to man after he is bald". Now more than anybody else, the tribal folks who have been the denizens of forest since time immemorial stand at the receiving end of the disaster as the worst victims.

Tribal communities live close to the nature. Their association with the forest goes back to the hoary past. Therefore they are known to others as forest dwellers. Being forest dwelling folks they have developed a symbiotic relationship with the forest. They depend heavily on the forest for their livelihood, shelter, occupation and employment. Their folklore, religion and worldview are woven round the forest.

Tribal communities in India largely inhabit forested regions, where for long periods of time they have lived in isolation. Forests not only meet their consumption needs, but also satisfy their deep rooted sentiments connected one way or the other with forests, right from birth to death. In time of distress like famine, forests are their last succour. Forests occupy a central position in tribal economy.

To the forest dwelling and forest dependent tribes forest is not merely a perennial and renewable natural resource for fulfillment of their basic needs but it is also the very foundation of their culture exemplifying the age-old serene pattern of coexistence between man and nature. It is a well-known fact that forest constitutes the important nexus in tribal's socio-cultural life. Therefore it is obvious that social and economic well-being of the tribals can not be ensured ignoring their dependency on the forest eco system.

This age old harmony of man with nature has been affected since the 19th century and particularly from the time of colonial administration. The major reasons are rapid growth of population, urbanization and industrialization, development and especially the commercial exploitation of forest resources based upon the policy of

treating the forests as national wealth and continuance of the policy even after independence. This has started a trend of massive deforestation and its consequent ecological hazards on one hand and erosion of age-old traditional rights of the tribesmen and their nature of dependency and relationship with the forest on the other making them the worst victims of deforestation. Because of the consequent limitations imposed on their traditional rights, the forest dwellers have been alienated from their life support system with which they had a symbiotic relationship. The tribes of Odisha are no exception to it.

The Central Committee on Forests and Tribals headed by Prof. B.K. Roy Burman observed, "Forests occupy a central position in tribal economy ...Forests cater to the basic needs of the people by providing food, fodder, fuel for domestic purposes, timber for construction of dwelling units and agricultural implements and other saleable products. They also generate rural employment..... The rural population, including the tribals, shares the hardship of severe firewood, timber and fodder scarcity, land degradation, soil erosion and flood damage...The...forests have been getting depleted under pressure of heavy demand for wood and forest products...Further, the depletion of forests has been instrumental in destruction of the rich fauna and flora which sustained the tribal population, exposing hillsides to land slides and erosion, washing away the fertile top soil making agriculture lands unproductive, leading to silting of dams and reservoirs and driving wildlife to the point of extinction ". (1982; 60-61)

The gravity of the situation of deforestation can be assessed from the fact that, at the time of independence nearly one fourth (23%) of India's land area was under forest cover and now it has come down to less than one tenth. It is said, India has been loosing on an average 1.3 million hectares of forests every year (Fernades, 1988).

" The stocking of existing forest has gone down appreciably; it is estimated that only 10% of the country's forest areas are capable of performing protective, productive, and ecological functions. The consequence of destruction of tree groves from the forest area as well as outside has created a situation where:

- There may be now enough food but not energy fuel to cook it with.
- There may be large number of cattle and sheep but not enough fodder to feed them.
- There is vast area under agricultural crop but not enough organic fertilizer to keep the soil in a healthy condition.

- Croplands have become devoid of protective cover from desiccating and soil eroding winds.
- Rivers have increased surface discharge of more than 10 times within the last 70 years, causing floods and damage, destruction and misery. " (Roy Burman, 1982;)

In absolute terms of the extent of the area of deforestation, Odisha comes among the top three most affected states. Forests that covered nearly 40 percent of the state's land area has dropped below 20 percent. (Fernades, 1988; 3) The trend of deforestation has become alarmingly high in most of the severely affected regions. It has led to critical environmental problems. The survival of a section of the state's population especially the tribesmen has been threatened by the scarcity of forest products. Besides, an increasing number of forest-based industries are threatened by the non-availability of forest-based raw materials.

Though Odisha is comparatively rich in forest resources, the standard of living of its people as a whole is quite low. Among them a vast majority of the tribals who are predominantly forest dwellers are socially, economically and educationally backward and relatively underexposed to the outside world. They live in clusters of villages mainly in the remote hilly areas, many of them primarily being dependent on shifting cultivation and minor forest produce (MFP). In other words, they depend on the forests for their very survival. Deforestation in and around their natural habitat and its far-reaching consequences has subjected them to untold miseries and sufferings.

The Research Study

The study aimed at assessment of the effects of deforestation on Odishan tribes. The Particularly Vulnerable Tribal Groups (PTG) i.e., the Lanjia Saora of Puttasing of Rayagada district in southern Odisha and the Juang-the autochthones of Gonasika hills of Keonjhar district in northern Odisha who live in remote forest areas in their simple societies in a state of semi-isolation and thrive upon a subsistence economy based on land and forest has been taken as the subjects of this study.

Objectives

i) To assess the extent of dependency of the tribesmen on the forest.

ii) To observe the change in their attitude towards forest in the context of depletion of forest resources, erosion of their traditional rights and consequently their alienation from the forest.

iii) To find out the changes in the socio-economic life effected by deforestation

iv) To suggest remedial measures for restoration of the symbiotic relationship between the tribes and forest and to minimize the impact of deforestation.

Methodology

The study was basically exploratory in nature. The fieldwork has been conducted in selected Lanjia Saora settlements located in and around the Lanjia Saora Development Agency (LSDA), Puttasing area in Rayagada district and the Juang Development Agency (JDA), Gonasika area in Keonjhar district. The quantitative data has been collected by administration of a set of Household Schedules covering one hundred households in 12 Lanjia Saora settlements and the equal number of households in 10 Juang settlements. Information on population, level of literacy, marital status, health status, occupations and employment, traditional skills, indebtedness, possession of livestock, produce of agriculture, horticulture and shifting cultivation, practice of hunting and fishing and collection of timber and non-timber minor forest produce in different seasons, household income and expenditure pattern etc. has been gathered through this schedule.

Qualitative data, on socio-cultural, economic and environmental impact of deforestation has been gathered through personal interviews, group discussion, non-participant observation, interaction with key informants and recording of case studies with the help of an Interview Guide. In case of the Saora a total number of 25 key informants representing 6 Lanjia Saora study villages namely, Rejingtal, Sagada, Gudada, Angra, Kereba and Alangda for the Juang 21 key informants belonging to 4 study villages namely, Tala Champei, Guptaganga, Kadlibadi, an Jantari participated in open-ended interviews and focused group discussions. In both the instruments of field investigation i.e., the Household Schedules and the Interview Guide an attempt has been made to elicit comparative data on important aspects of the problem as they were in the past i.e., 10 years back and the changes, if any, at present i.e., at the time of this study. This exercise has mainly covered the demographic and economic aspects of the tribe with reference to the impact of deforestation.

Regarding the secondary data, available references have been consulted and the relevant data, taken note of for the purpose of analysis and drafting of this document.

PART – 1

THE LANJIA SAORA

THE STUDY AREA AND THE ABORIGINE

The study area of Puttasing is a rugged, mountainous highland country predominantly inhabited by the Particularly Vulnerable Tribal Group(PTG) called the Lanjia Saora. It comprises 10 Lanjia Saora inhabited study villages spread over two Gram Panchayats (GPs) namely, Sagada and Puttasing under Gunupur Block, Subdivision and ITDA in Rayagada district. Puttasing is situated at a distance of 25 kilometers from its Block and Subdivisional headquarters, Gunupur and 100 kilometers from district headquarters, Rayagada and approachable by all-weather *pucca* road from Gunupur.

Physiography

This picturesque territory with its undulating terrain, rolling hills, terraced paddy fields, perennial hill streams and patches of lush green forests lies at an average elevation of 2000' above the sea level. It froms a natural geographic unit, comprising fertile valleys of the Vamsadhara and its tributaries between the mountain ranges of the Eastern Ghats. Puttasing hills rise on the eastern banks of Vamsadhara River to the north-east of Gunupur. Among the lofty hills, Thaladi Dongar is the highest peak with a height of 3217' from the sea level.

The lovely highland country in Puttasing is endowed with hills rising from two to three thousand feet and valleys radiating in all directions. All these valleys including the wide valley stretching eastwards to Sagada, extend towards south to Gunduruba and through Rejintal and Pattili to the market center at Jaltar. The passage from Rejintal to Boramsing and Sirijungsing runs across the picturesque forest clad wild country overlooked by the wuthering heights of the mighty hills, which are dotted with Lanjia Saora villages. Another route links Pattili to Regedising beyond which lies the Thalalaguda valley that leads to a beautiful hillstream called the Bangthalajodi. It flows through hills and forests upto the groups of villages around Barungsing. The whole of Puttasingi area is full of fertile valleys beautifully landscaped with terraced fields of various shapes and sizes.

The rivers flowing through this part of Saora country of Rayagada district are the Vanshadhara and Nagavali. Emerging from the extreme north of the Bissamkatak

Tahasil, the river Vanshadhara runs through Gunupur Tahasil. Gunupur town is located on its banks. The fertile river valley is occupied with cultivated lands. Beyond the valley are the mountains and forests of the great Eastern Ghats.

Geologically, the mountainous tracts of Puttasingi are mainly composed of ancient rocks, completely altered and crystallized by metamorphism. These series of metamorphosed sediments have been intruded by granites and green stones, chornockites and dolomites. Because of different kinds of metamorphism the texture of these rocks is either the schistose or gneissose. They all belong to the great Archean system of the Indian peninsula.

The soil type is red Laterite on the hill slopes. Brown to black soil is seen on the hill bottoms and valleys. Due to shifting cultivation and deforestation, soil erosion is evident on the denuded hills.

Flora

The flora of this region is predominantly composed of moist peninsular Sal (Shorea robusta) forests in the valleys and hill ranges standing at an elevation of 590' to 5000'. It ascends to the summit of the highest hills, but abruptly stops short southwards. Other common species available in this natural division are Piasal (*Pterocarpus marsupium*), Asan (*Terminalia tomentosa*), Fharua (*Anogeisser latifolia*), Mahua (*Madhuca latifolia*), Chakunda or Chhotasisu (*Dalbergia lanceolaria*), Garuda Nimbu (*Bursera serrata*), Kasaramba (*Garuga pinnata*), Harida (*Terminalia chebula*), Bahada (*Terminalia belerica*), mango (*Mangifera indica*), Karanj (*Pongamia glabra*), Kendu (*Diospiros melanoxylon*), tamarind (*Tamarindus indicus*), bamboo (*Dendro-calamus species*), etc. Among the underwood species Bhuinkhajuri (*Phonix acaulis*), Dahiphula (*Woodferdia futicosa*) and Odasamri (*Dyeas circinalis*) are important. The species of creepers include Siali lata (*Bauhinia vahili*), Atund (*Urbaria hamiltoni*) and (*Cembretum decandram*). There are grasses like the groom grass (*Thysanolaena agrotis*) and Sabai (*Imperrata arundinacca*) and Bagali (*Polimidum angustifocum*). Common species of economic importance found in the valleys are Kochila (*Strychues nux-vomica*), rethes (*Sapridus emorginatus*) and Kanta Baunsa (*Bambusa arundinaocea*).

The contribution of forest to the economic life of the Saora is very significant. In the past, the area was under thick forest cover. But now only patches of vegetations are left. It has been observed that while practising shifting cultivation, the Saora may fell valuable timber species but spare fruit trees like Mohul, jackfruit, tamarind, mango,

etc. This has given a clue to development agencies in dealing with the problem of shifting cultivation. Horticulture species are being planted in degraded Bagado (swiddens) slopes as an alternative to shifting cultivation. Recently by the efforts of the Micro Project, LSDA, Puttasing, horticultural plantations and more particularly, cashew plantations have been raised on the wastelands and barren hill slopes.

Fauna

Years ago it was a wild country rich in its natural wealth of flora and fauna. Tigers, panthers, leopards, bears, wild dogs, jackals, elephants, porcupines, fowls, spotted deers, barking deers, Sambars, wild pigs, wild goats, common langur and bander, bonnet monkey, peacocks, pythons, cobras were roaming in the wilderness. The Odisha District Gazetteers, Koraput (1966;.27) reported that Panthers and leopards were more common and more destructive to livestock than tigers. Among primates, the common Langur, the common Bandar and the Bonnet monkey were all found in good number. Among the game birds, peafowl is common. The Saora catch them by chasing from side to side of a steep narrow valley until they are exhausted.

Now the jungles have become empty of wild life as a result of slash and burn cultivation and deforestation. The fauna is also depleted with the forest. Tigers are rarely found now, although occasionally one hears of a stray panther or a leopard. Elephant herds still cause some damage, their number and appearance by no means of any consequence.

Climate

The climatic condition of the region is more like that of the Deccan plateau. Because of its elevation, the area experiences a mild and moderate climate, with a short and mild summer, moderate monsoon and a long winter. The hot summer lasts from March to May and chilly winter reigns from October to February. June to October is the time for monsoon. Seventy-nine percent of the rainfall occurs during the monsoon, i.e. June-October. The months of July and August are the rainiest months. The average annual rainfall over this hill tract is 67.05". The spatial distribution of rainfall in this area is largely influenced by the Eastern Ghats.

The Lanjia Saora; *A Socio-Cultural Profile*

The Lanjia Saora represent a primitive section of the Saora tribe inhabiting a contiguous mountainous territory stretched across Rayagada and Gajapati districts of Southern Odisha.

The "Saora" or "Savara" are a great ancient tribe. They are not only numerically important but also a historically and culturally significant tribal community of the State. They have been mentioned quite frequently in Hindu mythology and ancient classics, epics, purans and various other scriptures. Especially in Odisha, they have been very intimately associated with the cult of Lord Jagannath, who according to a legendary tradition originated as a tribal deity and was later brought to Puri under royal patronage.

The tribe is called by various names such as Saura, Sabara, Sahar, Saur, Sora, etc and has their racial affinity with the proto-Australoid stock, which is dominant among the aborigines of Central and Southern India. They are widely found all over the Central India comprising the Sates of Bihar, Odisha, Andra Pradesh, Madhya Pradesh, Maharashtra and West Bengal. They speak an ancient Mundari dialect of their own called Sora.

Numerically, the Saora constitute one of the major Scheduled Tribes of Odisha. They are found in almost all the districts of the State. But their main concentration lies in a contiguous mountainous territory forming a major part of the agency tracts of the Eastern Ghats in Rayagada (formerly undivided Koraput district) and Gajapati districts in Southern Odisha, which can be called, the "Saora Country". Their population in the state as recorded in successive Census enumerations from 1951 to 1991 is given below.

1951	-	1,91,401
1961	-	3,11,614
1971	-	3,42,757
1981	-	3,70,060
1991	-	4,03,510
2001		4,73,233

The census data show that the population of the tribe has been growing over period of time. Their population growth rate during the period 1971-81 was 8 percent, between 1981 to 1991, 9.04 per cent and between 1991 to 2001, 17.28 percent. As per the 1991 Census they have constituted 5.74 percent of the total tribal population of the state and held the fifth position among the 62 tribal communities on the basis of their numerical strength. The sex ratio was 1030 in 1981 and 1015 females per 1000 males in 1991 showing numerical superiority of

their women over men. In 2001 census their sex ratio 1007 females for 1000 males maintaining a diminishing trend of superiority of females over males.

They are educationally backward. Their percentage of literacy as recorded in 1981 census was only 14.47 per cent. In 1991 Census their literacy level has improved to 25.58 per cent as compared with 22.31 per cent for the total tribal population and 49.09 per cent for the entire population of the state. In 2001 their level of literacy has improved to 41.13 percent.

The Saora society is divided into as many as 25 subdivisions such as Kapu, Jati, Sudho, Jadu, Jara, Arsi, Duara or Muli, Kindal, Kumbi, Basu, Lanjia, etc. It is based on occupation, food habit, social status, customs and traditions. The "Lanjia Saora" who are called the "Hill –Saora" by some noted ethnographers like Verrier Elwin, constitute an archaic section of the tribe. They inhabit the "Saora country" in Southern Odisha as described above. They are famous for their expertise in terrace cultivation, shifting cultivation, elaborately religious lifestyle, artistic skills for producing beautiful wall paintings, pictograms popularly known as icons and their peculiar traditional male dress-style in which the ends of the loin cloth hangs like a tail at the back. Therefore their neighbours call them "Lambo Lanjia" meaning, "having a tail".

In the absence of separate census enumeration for the Lanjia section, their exact population is not known. However, their population in the areas covered by two Micro Projects viz, LSDA, Puttasing and LSDA, Serango is 7,587 as per the survey conducted by SCSTRTI during 2001-02. By 2007 this has increased to 11215 (5597 males and 5618 females) showing numerical dominance of women over men according to another socio-economic survey conducted by SCSTRTI in collaboration of the concerned Micro Projects during 2007 for preparation of Conservation-Cum- Development (CCD)Plan for PTGs for the 11th Five-Year Plan. Further according to a socio-economic survey conducted by SCSTRTI in 2010 their population has rose to 11 512 persons (5595 males and 5917 females)

They are distinguished by their characteristic style of dressing especially the long tailed loincloth of males as stated above. Traditionally the men used to wear loincloth and women, a skirt. The latter use ornaments to adorn their ear, nose, waist and ankle. Now men wear dhotis, shirts, banyans, pants and women wear sarees, blouses, petticoats etc.

The Lanjia Saora villages are found in the inaccessible interiors and in most cases lie hidden in the forests making it difficult to reach them except through

zigzag footpaths. Their villages are generally small, the average size varying from 200 to 800 people. Whether small or big, the Lanjia Saora villages are long established in their present sites. The settlements have come up in undulating terrain and houses remain scattered. Close to the settlements megaliths are erected to commemorate the dead kins. An ordinary house is a one-roomed thatched rectangular dwelling having stone and mud walls with high plinth verandah. Two wooden posts, called Gasadasum or Kitungsum installed at the entrance of the settlement, represent the guardian deity of the village. In these days due to the impact of modernization and development intervention, many remote Lanjia Saora settlements have got a facelift. Approach roads connect them and inside they have concrete street roads and paths. Modern *pucca* houses have replaced their tiny old huts.

The subsistence economy of the Lanjia Saora rests primarily on slash-and burn agriculture i.e., shifting cultivation and importantly on terrace cultivation. They are, traditionally shifting cultivators and at the same time have expertise in terrace cultivation. They depend upon land and forest for their subsistence and supplement their earnings by occasional hunting, fishing, wage earning and round the year forest collections. They exhibit a high degree of indigenous skill, ingenuity and technological outfit for preparing the terraces with inbuilt water management system. Mainly they grow rice in terraced fields and a variety of minor millets, cereals, and pulses in the swiddens. In fact, it is more extensively practiced in the area, which stretches from Puttasing to Gumma block areas than in other areas. Among many remarkable features of their socio-economic life is their traditional system of labour cooperative called ansir, which ensures them supply of labour for labour intensive operations like swidden cultivation, house construction, terrace making and terrace cultivation, and a host of other activities in the village.

For shifting cultivation, a hill slope is divided into several plots, demarcated and distributed for cultivation. The farmer who has been cultivating a particular plot of land continues to own it as long as he is capable of cultivating it. When he fails to do so, the plot is allotted to some one else who has needs it. In no case are the plots left fallow nor is a plot already owned by one capable of cultivating it, allotted to anyone else. Thus, individual ownership of the swidden plots is recognized on a hereditary basis.

The crops grown in the swidden are Kangu (Panickm), Gangoi (a kind of millet), Kandula (*Dolichos catjang*). They also grow turmeric as a cash crop in swiddens

and paddy in terraced lands, as a crop that is used more for clearing debt and for cash needs than for food. With the simplest implements such as a hoe and a small axe, they are able to raise crops sufficient to maintain their families. Their success in agriculture depends upon their extensive knowledge of the crops suitable for cultivation on the hill-slopes, upon the geographic conditions of the locality, and last but not the least, upon hard work with a team spirit.

Their aesthetic life manifests through colourful dance, typical music and the wall paintings, *anital*, in particular. The icons are so skillfully dreamt and drawn that these have made them famous among the scholars and artists of the country and aboard.

The Lanjia Saora pantheon includes numerous gods, deities and spirits- benevolent and malevolent. They are worshipped with fear and anxiety. People offer sacrifices for safety and wellbeing of the family members. Most of the festivals revolve round agricultural cycle and lifecycle rituals. *Guar* is celebrated to commemorate the dead. In their society, the most potent factor for ensuring social conformity is the fear of religion, which forms an indispensable part of Saora life and acts as a powerful deterrent against violation of established customs.

The Saora social organization is distinguished by absence of exogamous totemic clans, phratries, and moieties. The main exogamous unit is the extended family descended from a common male ancestor. This unit is called *birinda*, which is based on patrilineage. Women even after marriage continue to belong to the brother's *birinda*. The family is mostly nuclear and the well to do practise polygyny.

The homogenous Saora village is an independent, autonomous and self-sufficient socio-political unit with remarkable cohesion and continuity. The traditional village organization possesses, a well-defined territory, a hierarchy of responsible and respectable aristocracy and leadership and a traditional village council composed of family heads, called "Birinda Neti". The organization is based upon democratic principles. There are a secular headman (Gomango / Naiko), a sacerdotal headman (Buya / Karji / Jani), headman's subordinates- (Mandal / Dal Behera), messenger (Barik), astrologer (Disari) and Shaman (Kudan / Beju). By virtue of their knowledge, experience, service and specialization in their respective fields, they have been holding positions of respect and authority in the village. The matters concerning the village are decided in village meetings held under the chairmanship of the Gomango in presence of other leaders and the family heads. Decisions are reached mostly by consensus and not by majority vote. Punishment for various offences consists of impositions of fines on the offender in forms of cash, liquor, goat, fowl etc. that are

offered to the gods and spirits and then consumed in a community feast. Till the recent past, the village headman was yielding vast powers for the maintenance of law and order, peace and good government in the village. The other leaders were guardians of the cultural, religious and economic norms for their traditional society. Now the situation is different.

Like their magico-religious life, dress-style, artistic talents and terrace cultivation skills, another important feature is their keenness to maintain their group solidarity and preserve their cultural identity by adhering to the ethics, values, morals, customs and traditions, which are unique. Their interpersonal relations are governed by fixed status and well-defined customs, which are applicable to all aspects of social life. The ethical percepts and norms are transmitted from generation to generation through the informal process of socialization.

Since the remote past the Lanjia Saora lived undisturbed in their remote mountainous habitat. In modern times, the rapid changes in administrative set-up and political climate of the country and their exposure to the external modern world have influenced the Saora way of life. For example, abolition of intermediary system has set the Saora free from the clutches of the oppressive feudal over lords and their unscrupulous subordinates and this has contributed to the modernization of their political organization.

After independence, the welfare Government has taken a very benevolent attitude towards improving the lot of the downtrodden tribal people of this country including the Saoras. Various welfare measures initiated by the Government have resulted in exposing the Saora more and more to outside contact and pressures of ever-advancing and powerful social, economic and political forces. During the 5th Plan, Tribal Sub Plan (TSP) approach was adopted and Lanjia Saora was identified as one among 13 Primitive Tribal Groups (PTG) in Odisha. For their all round development of two Micro Projects, one located at Puttasing in Rayagada district and another at Serango in Gajapati district have been established. The Micro Projects have adopted the basic approach of Tribal Sub Plan, that is, location specific and community specific holistic development of the target area and the people. The objective is to raise the living conditions of the Lanjia Saora and change them from a primitive and pre agricultural stage of shifting cultivation to modern agriculture and the culture of such other beliefs and practices. The impact of the political change, election system, adult franchise and local self-government have triggered off various political processes and generated new leadership among them.

EFFECTS OF DEFORESTATION: ENVIRONMENTAL

In these days forests have come to be regarded as a non-renewable resource rather than a life support system meant to cater to the needs of the people who depend on it. The forests as whole function as the biomass system that keeps the ecological balance needed for the rain and for the water and soil preservation and soil fertility maintenance cycle, essential for the of the people's survival, especially of the forest dwellers. This balance disappears with deforestation.

"An immediate consequence of deforestation is environmental deterioration. A natural forest makes provision for a balance between the destroyers of crops and their predators, both of which are needed for the control of the environment. Trees with large leaves provide the protection the soil needs from wind, sun and heavy rain and preserve the moisture needed to keep up the water level. The role of trees, particularly of their roots, in preventing soil erosion is well known." (Fernades, 1988; 216-17).

Forests ecologically influence natural phenomena like rainfall, atmospheric quality, floods, landslides and other natural disasters. Today the disastrous consequences of deforestation manifests in many forms like soil erosion due to inadequate tree cover, drought due to loss of ground water storage, floods due to run off water, and landslides due to the denudation of hills. Studies in the USSR have revealed how forest vegetation determines the quantum of run off from a watershed. The human society has learnt it since ages that it can not survive without the blessings of nature. Now, it is scientifically an established fact that the role and functions of forests in maintaining the ecological balance are very significant.

In Odisha, as in most other states, the extent of tree cover is closely related to the extent of exploitation of forest resources and the type of people's dependence on forests. Like it is happening everywhere, in Odisha also it is a case of over-exploitation of forests by various agencies. Rather the extent of forests denuded by industrial interests and development infrastructure has a direct bearing on the destruction of forests by the people. Its cumulative deleterious effects are visible and felt in the economic hardship of the dependant people, economy of the state as well as the abrupt climatic change and natural calamities like Super Cyclone of 1999

that devastated the state and took away 10 000 human lives apart from loss of property of thousands of crores.

Now the Lanjia Saora of the study area, Puttasing, have come to realize the fact that the destruction of nature leads to the deterioration of human beings, especially those belonging to the weaker sections like themselves who has been depending on nature for their very survival since time immemorial more than the others. Consequently, any deterioration of the environment hits them harder than any other groups.

To know their perception of the present situation of deforestation and its deleterious impact on the natural environment in their habitat, some key informants were made to speak through open-ended interviews and focused group discussions in course of the study. The deliberations covered questions like changes occurred in forest area coverage, forest density and the location of village with reference to forest: how deforestation has affected the environment, how the impact deforestation is seen in shape of deterioration of the soil and if those are responsible for i) decrease in yield from agriculture, horticulture and shifting cultivation, ii) drying of water sources iii) erratic and reduced rainfall, iv) unpredictable climatic conditions, v) rise in atmospheric temperature and vi) draught

Regarding the change in the area under forest coverage all of them agreed that it has reduced very highly by 70-75 percent and the forest density has decreased highly by about 60 percent.

Two to three decades back the villages like Kereba, Alangda and Angra were surrounded by forests: other villages were close to forests i.e., lying within a walking distance of 2 kms. Now the receding forest lines have stretched the distance from 2kms up to 10 kms. This is the common opinion of all the 25 key informants regarding the location of their respective villages with reference to forest.

All of them felt that deforestation has highly affected the natural environment of their habitat. The impact of deterioration of natural environment is visible in deterioration of the soil through the ongoing process of soil erosion, loss of soil nutrients, fertility and moisture. They know that the trees extending roots into the earth hold the soil from being washed away by flowing water and help retaining the soil moisture by increasing the porosity of soil.

"It is estimated that about 6,000 million tones of topsoil is washed or blown away every year in India. Considering the fact that cultivable soil consists of the top

18 cm. This means a loss of 2.4 million hectares of cultivable land every year when in fact it takes centuries to form even an inch of topsoil." (Gadgil, et al, 1983; 15).

The people interviewed agree that deforestation is responsible for the deterioration both in the quantum and the quality of soil. Denudation of forests, over grazing and other destructive measures result in soil erosion. They claim that soil fertility has declined, considerably over the last three decades.

A major problem that arises from soil erosion is the rise in the river beds because of siltation that causes over flooding. Many of them are aware of this fact

They attribute drought to reduction of moisture in soil due to the felling of evergreen trees with large leaves that protected land from the summer sun. With the over exploitation of forests and clear felling of the trees that provide the humus required for retaining the ground water level, the condition certainly gets worse. They believe that this has led to the lowering of the water table, reduction of moisture in the atmosphere and the consequent decrease in rain or to erratic rainfall. Also the people attribute to deforestation, the decrease in yield from plain and wet lands, swiddens and horticultural plantations, drying of water sources, unpredictable climatic conditions, rise in atmospheric temperature, flood and draught that has become a regular feature during the last few decades. The consequences of drought such as acute shortage of drinking water, scarcity of food for crop failure, shortage of fodder and of alternative livelihood is well known to the people.

Traditionally life of the tribesmen depended on the forest. Now they have come to understand that this equation has been disturbed by deforestation. Destruction of forests is not merely disappearance of trees but of the resource on which the tribal economy, culture, social life and religion depend. Consequently, the destruction of their habitat does not merely deprive them of their very life support system but sets a new destructive process in motion that does harm to the life and culture of the tribals like the Lanjia Saora and other forest dwellers.

EFFECTS OF DEFORESTATION: SOCIO-ECONOMIC

Tribals are inseparable from forest not only ecologically but economically too. Apart from being the principal source of food, such as cereals, roots, tubers, vegetables, fruits and nuts, animal proteins, etc, forests also provide the tribals with herbal medicines. The denizens of forest satisfy their numerous needs from the forest with the help of most simple implements and without any technological aid from outside. They depend on the forest flora and fauna for their livelihood and collect various kinds of Minor Forest Produce (MFP) in different seasons. So, forests occupy an important position in the tribal economy.

Tribal people generally thrive on subsistence economy traditionally derived out of hunting, food gathering and shifting cultivation. Being forest dwellers they have few viable economic alternatives and employment opportunities. Naturally, they have to depend on subsistence agriculture and on the forest. The extent of this dependence needs to be studied in order to understand both its extent and its consequences in the backdrop of deforestation. At present, the majority of tribals sustain their livelihood by a combination of *podu* cultivation, collection of forest produce, settled agriculture and wage labour.

While the state of Odisha is comparatively rich in forest resources, the standard of living of its people and especially the tribals is quite low. What is of primary relevance to our study, however, is the socio-economic condition of the tribals like the Lanjia Saora as affected by the consequences of deforestation given the facts that a vast majority of the tribals who are predominantly forest dwellers are economically backward, pre-literate and underexposed to the outside world. They live in clusters of villages mainly in the hilly areas, dependent primarily on shifting cultivation and minor forest produce (MFP). In other words, they have been depending on the forests for their very survival from time immemorial.

The Lanjia Saora have lived with the forest for centuries and built up a symbiotic link with forest in context of their social, cultural and occupational life. Forest has remained an important resource base for them. Therefore, depletion of forests has not only disturbed the ecological balance but also put pressure on the forest resources as well as the Lanjia Saora as forest dwellers. As they live close to the forest with

which their life is intimately integrated, they find it extremely difficult to sustain their livelihood and to pursue their traditional occupations because their perennial source of subsistence is disintegrating in these days.

While the forest go on shrinking day by day, environmental problems surface and the Lanjia Saoras' struggle for survival continue to grow, weakening their traditional economy, affecting their socio-economic existence and forcing them to migrate to urban areas seasonally. In this situation, it becomes imperative to understand the magnitude and direction of the impact of deforestation on their socio-economic living conditions especially with reference to their occupational position, social and cultural life, living standard and economy as a whole.

Study Villages

In the study area, the villages are generally inhabited exclusively the Lanjia Saora in which no other communities are found. The 100 Lanjia Saora households covered under the study belonged to 12 villages / hamlets- 11 of these are inside the LSDA micro project area and the remaining one just lying on the periphery of the project area. The details are given below.

Sl. No	Names of the Lanjia Saora Study Villages/ Hamlets	Number of Study Households
	(Within LSDA Area)	
1	Sagada	41
2	Railpadar	2
3	Gudada	14
4	Dungdungar	1
5	Angara	12
6	Tarbel	1
7	Karanjasing	1
8	Anjarsing	1
9	Kereba	11
10	Alangda	1
11	Marakoi	9
	(Outside LSDA Area)	
12	Rejingtal	6
Total		**100**

Population, Marital Status & Literacy in Study Households

COMPONENTS	MALES	FEMALES	TOTAL	SEX RATIO (No of Females per 1000 Males)	AVERAGE HOUSEHOLD SIZE
	(Percentages in brackets)				
Population	322 (48.64)	340 (51.56)	662 (100)	1056	6.6
Marital Status				Observations	
Married	114 (35.40)	132 (38.82)	246 (37.16)	More married women than men	
Unmarried	199 (61.80)	190 (55.88)	389 (58.76)	More unmarried men than women	
Divorcee	2 (0.62)	2 (0.59)	4 (0.60)	Very low incidence of divorce	
Separated	-	2 (2.18)	2 (0.30)	Very low incidence of separation involving women only	
Widow/Widower	7 (2.18)	14 (4.12)	21 (3.17)	More Widows than Widowers	
Total	322	340	662		
Literacy					
Literates	144 (44.72)	59 (17.35)	203 (30.66)	Total Literacy & Female Literacy Low	
School Going Children	90	49	139		

THE ECONOMIC SYSTEM

The Lanjia Saora thrive on a subsistence economy founded on land and forest. Traditionally they were hunters, food gatherers from forest and shifting cultivators. Since generations, they have been "...living in hill slopes and mountain terrains..." and "...deriving nourishment from the resource bases of the hills and forests in multiple of such ways satiating small needs and making a bare minimum living. ... Up until the time the hilltops and hill slopes were having verdant forest growth, the Saora were exploiting the hills and swiddens with mirth and furry. Swidden cultivation was their way of life. ... With the depletion of forest growth and the underwoods, swidden cultivation did not pay dividends and the Saora started preparing terraced fields by stone bunding method in an ingenious way" (Nayak, 1992: 36).

Skills & Occupational Pattern; Continuity & Mobility

With the rapid depletion of forests leading to deterioration of natural environment, their traditional life support system i.e., their economic resource base has been squeezed. Their dependence on traditional sectors such as, hunting, shifting cultivation, animal husbandry and other forest based subsistence activities including collection of minor forest produce have declined slowly in course of time following

the trail of deforestation. Gradually, they have taken up pursuits like settled terrace cultivation to grow paddy, horticultural plantations and wage labour. Now the Lanjia Saora are exhibiting a trend of temporary seasonal migration, especially in the lean seasons, to far-off states like Maharastra, Assam, Arunchal Pradesh etc to earn higher wages by their engagement in unskilled and semi-skilled avocations such as carpentry, masonry, plumbing, auto-driving, machine operation, construction workers, tea garden workers and the like. They come back to their native places before the onset of agricultural season bringing with them the new ideas and acquired modern skills as well as the accumulated savings out of their incomes. The following Statements show the position in respect of the Study Households.

TOTAL POPULATION OF STUDY HOUSEHOLDS		SKILLS						
		TRADITIONAL			MODERN			
		Stone Bunding	Saora Painting	Saora Dance	Mason	Carpentry	Photography	Weaving
Males	322	49	-	1	23	2	1	1
Females	340	-	3	-	-	-	-	-
Total	**662**	**49**	**3**	**1**	**23**	**2**	**1**	**1**

- Many Saora men are skilled in their traditional art and techniques of stone bunding that is required for preparing terraces for paddy cultivation, dry and upland cultivation, horticultural plantation and water management.
- While terrace making is men's job, women carry on with their famous tribal artistic traditions i.e., the wall painting of icons called *idital* or *inital*. Ofcourse with the advent of modernity and Christianity this visual folk art is losing ground and only few Saora men and women keep this rich tradition alive. Lately, the State Government of Odisha in ST & SC Development Department has imparted training to thirty young Lanjia Saora boys and girls with the help of a Lanjia Saora Wall Painting Expert and the Art Teachers of B.K. College of Arts & Crafts to preserve and promote this declining tribal folk art tradition.
- The Saora dance with song and music is another folk tradition suffering from the same fate of decline and decadence like the wall painting. Now only few Saora men and women possess skills in this age-old performing art because the younger generation lacks interest to continue the tradition.

- Acquisition of modern skills like masonry, carpentry, photography, weaving etc. is a recent phenomenon brought about by their mobility and exposure to the modern world when the decline of their traditional economic base effected by deforestation and environmental degradation pushed them forward to look for greener pastures outside the cocoon of their natural habitat as stated earlier. It is interesting to note that only men possess these new skills because generally they move out leaving their women and children behind to take care of their home and hearth.

STUDY HOUSEHOLDS (Percentages in Brackets)			**MAJOR OCCUPATIONS** (ENGAGEMENTS IN MANDAYS) (Per Capita Average in a Year given in Brackets)				
Break up	Total Population	Working Population *(15-59 Yrs)*	Terrace Cultivation	Shifting Cultivation	Horticulture	Forest Collection	Total
Males	322 (100)	146 (45.34)	5 971 (41)	6 454 (44)	4 268 (29)	4 964 (34)	**21 657** (148)
Females	340 (100)	174 (51. 17)	8 024 (46)	8 578 (49)	5 726 (33)	6 090 (35)	**28 418** (163)
Total	**662** (100)	**320** (48.34)	**13 995** (44)	**15 032** (47)	**9 994** (31)	**11 054** (35)	**50 075** (157)

- Less than half of the population (48.34%) of the study households belonging to the age group of 15—59 years comes under the category of Working Population.
- Corresponding to the sex ratio and marital status, women maintain superiority over men, both numerically and percentage wise, in this segment.
- The average engagement of the Working Population in major economic pursuits like Terrace Cultivation, Shifting Cultivation, Horticulture and Forest Collection keeps them occupied for less than half of a year. It means they remain under-employed and hence temporarily migrate outside in search of wage and employment as stated earlier.
- Sector wise each and both the sexes spend the largest number of days in average in Shifting Cultivation followed by Terrace Cultivation and Forest Collection and the minimum in Horticulture. Thus forest based subsistence activities, in combination of Shifting Cultivation and Forest Collection, still remains their major economic pursuit in terms of the extent of engagement for their age old dependence on forest.
- In terms of average engagement in these avocations women work more than men in each and all sectors.

Agriculture

Agriculture is the mainstay of the Lanjia Saora economy. In recent times it has taken precedence over shifting cultivation – the traditional mode of their subsistence which no longer remained profitable under the cumulative impact of deforestation, ecological imbalance and decline of land / man ratio due to pressure of growing population. Since cultivable land is in short supply in their area for undulating nature of the hilly terrain and population growth, they have tried to find an answer to this problem by mastering the art of preparing and cultivating terraced paddy fields on the lower hill slopes and bottoms. Yet, they still have to continue with shifting cultivation to supplement their earnings from settled (terrace) cultivation, forest collection, wage earning, and other economic pursuits. They exhibit a high degree of indigenous skill, ingenuity and technological outfit for preparing the terraces with inbuilt water management system. Mainly they grow rice in terraced fields and a variety of minor millets, cereals, and pulses in the swiddens.

Now, the Lanjia Saora of Puttasing area possess three kinds of productive assets of agriculture – (i) Saroba: the terraced paddy fields for wet land settled cultivation, (ii) Baseng: the up and dry land and (iii) Bagado for shifting cultivation. The Baseng and Bagado are meant for growing a variety of cereals, pulses, oilseeds and vegetables.

Cultivable Land Holding Pattern

Total Study House holds	Land Less House holds	LANDOWNING HOUSEHOLDS CLASSIFIED INTO SUCCESSIVE CATEGORIES OF FARMERS						
		Items	*Marginal Farmers* (> 1Ac)	*Small Farmers* (1.1-2.5Ac)	*Medium Farmers* (2.6-5Ac)	*Big Farmers* (5.1 >)	*Total*	*Observations*
100	3	No of Households	21 (21.64)	37 (38.14)	23 (23.71)	16 (16.49)	97 (100)	• Cultivable lands include all kinds of agricultural & Horticultural lands excluding the swiddens • 3 % of the Study Households are landless • Small Farmers form the majority group among all categories • Bulk of the landowning households fall under Marginal & Small Farmers category
		Total Area of Landholding (*Saroba & Baseng*) (in Acs)	13.38	64.30	81.53	105.82	265	
		Average Landholding Per Household (in Acs)	0.64	1.74	3.54	6.61	2.73	

Trend of Agricultural Production

Settled agricultural practices of the Lanjia Saora mainly revolve around their *saroba:*, which they regard to be their valuable productive asset. The following statement reveals that almost all of the study households (97%) possess and cultivable wet lands in shape of *saroba* at an average of 1.63 Acres per farmer household. Where adequate water for irrigation is available, they raise a second paddy crop in *saroba* during summer months. *Baseng* – the up and dry land is not as productive as the *saroba*. However majority (91%) of the study households have pieces of *basengs* in an average of 1 acre per household, which, as shown in the following statement, they utilize for mixed cropping like they do in their swiddens *(bagado)*.

The comparative picture of agricultural production in the past and present given in the following statement shows that

- Production of paddy crop from the *saroba* in terms of total quantity has come down by -11.38 percent.
- In case of the annual yield from the *baseng*, the rate of decline is higher than *saroba* Among all the different categories of crops grown in *baseng* as well as the *saroba* the rate of fall is the highest (-19.79%) for the oil seeds.

Category of Farmland	Number of Farmer House-holds (HH)	Total Area of Land holding Average Per HH (in Acs)	Cropping Pattern	Annual Yield (in Qtls)					
				PAST (About 10 Yrs Ago)			PRESENT		
				Total Yield (100)	Average		Total Yield (% Of Change)	Average	
					Per HH	Per Acre		Per HH (% of Change)	Per Acre (% of Change)
Saroba (Terrace & Plain Lands	97	158.41 (1.63)	Paddy	1607.5	16.57	10.2	1424.5 (-11.38)	14.69 (-11.35)	9.09 (-11.43)
Baseng Up& Dry Land	91	97.51 (1.07)	Cereals: *Maize, Ganga, Bajra, Suan, Kundakthan Kangu, Ragi, Jana, etc*	154.77	1.70	1.59	134.58 (-13.04)	1.48 (-12.94)	1.38 (-13.21)
			Pulses: *Kandul, Kulthi, Mung, Biri, Bargudi, Jhudung etc*	82.47	0.91	0.85	69.92 (-15.21)	0.77 (-15.38)	0.72 (-15.29)
			Oil Seeds: *Til, Mustard, Castor etc*	28.95	0.32	0.30	23.22 (-19.8)	0.26 (-18.75)	0.24 (-20)
Total	**97**	**255.92 (2.64)**		**1873.7**	**19.32**	**7.32**	**1652.22 (-11.8)**	**17.03 (-11.85)**	**8.46 (-11.75)**

People's Response on the Situation

The Statement produced below shows that the Lanjia Saora farmers generally know the reasons for decrease of their farm output. They mainly attribute the consequences to (i) Deterioration in the Quality of Soil, (ii) Uncertain Agro-Climatic Conditions manifested in erratic and inadequate rainfall. Since their farmlands lack assured irrigation facilities, they are bound to be dependent on the natural agro-climate to reap a good harvest. Deterioration of the natural environment over period of time has become a matter of major concern for them.

All the respondents (100%) agree on the point that their farm outputs are shrinking for Loss of Soil Fertility. The soil has not remained as fertile as it has been in the past. In addition to that nearly half and one third of them have identified other important causative factors like Soil Erosion and Uncertain Agro-Climate with Inadequate and Erratic Rainfall.

Further opinions emerged on the state of affairs in the group discussion

- In the past, when they lived in the vicinity of lush green forests, the rainfall was abundant and the soil, fertile. Shifting cultivation and forest collections produced enough to feed lesser number of bellies. As these traditional sources started drying up day by day, their dependency on wet terrace paddy cultivation has increased.
- Population is increasing. Cultivable land holdings are becoming smaller after family partitions.
- There is little scope for expansion of farmland area for the stiff hills and the undulating terrain of their habitat.
- Now agricultural yields do not sustain many of them for a full year. Therefore they have to take recourse to seasonal migratory labour.
- One third of them know that destruction of natural vegetations and population rise lie at root of the present problems.

Total Number of Respondent Farmers	Farmland Category	Stated Reasons for Decrease of Farmland Yields (No of Respondents)		
		Deterioration of Natural Environment		
		Deterioration of Soil Quality		Uncertain Agro-Climate
		Soil Fertility Declining	Erosion of Fertile Soil	Inadequate & Erratic Rainfall
97 (100)	Saroba	53 (54.64)	31 (31.96)	13 (13.40)
	Baseng	47 (48.45)	19 (19.59)	21 (21.65)
	Total	**97** (100)	**50** (51.55)	**34** (35.05)

Horticulture

The Lanjia Saora love trees. Therefore they take all care to preserve the fruit plants like date palm, mango, jackfruit, tamarind, *mohul, salap, ramphal, sitaphal* etc in their villages, hills and swiddens. They save the fruit bearing and other useful trees while they clear off all other vegetations for starting the cycle of shifting cultivation in their swiddens. Besides, they raise kitchen garden in their backyards or in the close proximity of their houses and orchards if suitable sites are available.

Presently, following the gradual decline in agricultural production and forest produce they are looking for dependable supplementary sources in horticulture. They have started growing many new varieties of economic species including vegetable crops introduced by themselves as well as the development agencies like the concerned ITDA, DRDA. and LSDA as evident from the following Statement.

It is worth-mentioning here that the horticulture programme introduced by the development agencies as an alternative to swidden cultivation has become popular among the Lanjia Saora. Now besides the development of kitchen gardens and backyard plantations, mixed orchards and plantations of commercial cash crops, cashew have been raised in wastelands and hill slopes often covering parts of *podu* ravaged and degraded swiddens. Especially, the cashew plantation drive has received overwhelming popular response for its low maintenance and high profitability. Now, they are now growing cashew on their own initiative without depending on external assistance that they received in the initial phases. Presently more than 80 percent of families own cashew orchards from which comes a good part of their income. Helping them to enhance their level of income, it has emerged as a economically gainful pursuit. As a result, shifting cultivation is gradually being pushed to the back stage.

- The data given in the following statement shows that, horticultural plantations in shape of kitchen gardens, backyard plantations owned by 96 study households and orchards raised by 83 households out of total 100, now cover a total land area of 157.46 acres at an average of 1.64 acres per household which also includes the cashew plantations raised in the degraded swiddens. That means almost all the study households possess horticultural plantations of one kind or other.
- The deleterious impact of ecological imbalance effected by deforestation is also noticed in gradual downslide of horticultural production (- 20.5%) particularly in their backyards and kitchen gardens where they mostly raise conventional crops as it is happening to agricultural production but the deficit in made up by newly introduced crops like cashew, zinger, pineapple, coconut, tomato, cauliflower, beans etc.
- These new horticultural crops and especially, the cashew have reversed the trend of negative growth in all other sectors of production registering a notable rise of +14 percent for the Orchards and +5 percent in total

horticultural production nullifying the -20.5% decline in the yields of backyards and kitchen gardens over the past decade.

- Formerly they were producing horticultural crops to meet their own consumption needs. After being aware of the fact that fruits and vegetables fetch a good price in the market, now they have started raising modern HYV species and coming to the local weekly markets to sell their horticultural produce and buy their provisions with the sale proceeds. This trend has begun since 10-15 years.
- The respondents said that the area under horticultural plantations has grown in the meantime and more particularly for the popular acceptance of the cashew plantation.

Category of Farmland	Number of Farmer House-Holds (HH)	Total Area of Land holding Average Per HH (In Acs)	Plants /Crops Raised		Annual Yield (in Qtls)					
					PAST (About 10 Yrs Ago)			PRESENT		
					Total Yield (100)	Average		Total Yield (% 0f Change)	Average	
			Traditional	New		Per HH	Per Acre		Per HH (% of Change)	Per Acre (% of Change)
Kadung Sing Backyard & Kitchen Garden	96	9.11 (0.10)	Gourd, Pumpkin, Maize, Cucumber Papaya, Drumstick Bean Green leaves Chilies, Jackfruit, Tamannd, Mango *Sitaphal Ramphal*	Brinjal, Cabbage, Ladiesfinger Cauliflower, Tomato, Coconut, Lemon, Banana Orange, Guava	407.5	4.24	44.7	324 (-20.5)	3.38 (-20.3)	35.56 (-20.5)
Kota Orchard& Swiddens	83	148.35 (1.79)	Banana, Cucumber Lemon, Pumpkin, Gourd, Guava, Beans, Chilies, Jack fruit, *Salap Karanj Sitaphal, Ramphal, Mohul,* Datepalm Mango, Tamannd	Brinjal, Cabbage, Bean, Ladiesfinger Zinger, Culiflower, Tomato, Radish, Coconut, Lemon, Pineaple, Orange, Guava, **Cashew**, Mango, Jackfruit	1662.2	20	11.2	1851 (13.8)	22.30 (11.3)	12.48 (11.5)
Total	**96**	**157.46 (1.64)**			**2069.7**	**21.6**	**13.1**	**2175 (5.09)**	**22.66 (4.95)**	**13.81 (6.0)**

Shifting Cultivation

Shifting cultivation is an archaic agricultural system in which forests are cleared by felling and subsequent burning and are cropped discontinuously by employing a fallow period larger than the period of cropping. The salient characteristic features of shifting cultivation are (i) rotation of plots (ii) slash and burn of vegetation before cropping (iii) use of family and cooperative labour as chief input (iv) application of crude technology by use of simple implements such as hoe, digging stick, knife, axe, sickle etc (v) non-use of modern agricultural technology and draught animals (vi) abandoning the site for a couple of years for regeneration.

It is a well-known fact that the folks i.e., mostly tribals, dwelling in the interior mountainous forest tracts, resort to this archaic mode of cultivation, where enough plain lands are not available for settled cultivation. They continue with the practice, as they have no other alternative. "Not withstanding the meager yield...the most remarkable feature of this mode of cultivation is that almost all varieties of cereals, pulses, millets, oil seeds and vegetables are grown in one plot which is well neigh impossible in the plain wet land cultivation" (Behura, 1990:2). These folks who struggle hard to survive "...without any assets other than their own labour have found a natural answer in shifting cultivation to the physiographical characteristics of land from which they have to eke out their precarious livelihood." (Chandrasekharan, 1983:20).

The existence of this primitive agriculture since the hoary past is a proof of its deep impact on the tribals' mind and psychology. It's continuation across generations since time immemorial has made it a way of life for them. "It has undoubtedly evolved as a reflex to the physiographical character of their habitat. People who lack emic perspective condemn it as pernicious and detrimental to ecosystem. In common prevalence it has acquired disparaging connotations. Nevertheless, it is a type of farming technology based on specific adaptation to forest and hilly environments" (Behura, 1990:2).

So long as the land man ratio remained favourable, this practice did not pose so much of a problem. However with the growth of population over period of time, the equilibrium between the people and forest area has been disturbed. This has effected the reduction of fallow period in between two cropping cycles leading to rapid depletion of soil fertility and permanent damage to land, which again led to extension of its coverage to larger tracts of forestland. As such it does not help the

tribals to get a good return and therefore, to attain a standard of life beyond the subsistence level. Studies made by T.H.R.T.I, among tribes practicing shifting cultivation including the Lanjia Saora, show that this practice is uneconomic as the requirement of seed and labour is high and the returns are low as compared to the settled cultivation in plain lands.

Traditionally for the Lanjia Saora, swidden cultivation has been devised and adopted by them as one of the main mode of living. They grow a variety of crops in their swidden fields, which they generally call *bagado* with the help of a small number of implements. "... the methods employed being crude, the process being labour intensive, and the productivity being low... swidden cultivation was their way of life. Establishing small settlements nearer to the swidden fields was the practice; and moving the settlement site alongside moving into virgin swidden plots was the norm... With the depletion of forest growth and the underwoods, swidden cultivation did not pay dividends" (Nayak, 1992: 36). Now the Saora have learnt in a hard way that this ageold mode of subsistence would no longer sustain their growing population. While they are trying to reduce their dependence on this less productive enterprise and looking for alternative sources of livelihood, they are yet to abandon the practice altogether. The data presented below gives a picture of the cycle of shifting cultivation, coverage of area, cropping pattern, on going process of decline of production, people's awareness about the causative factors etc in a comparative way.

The preceeding statement clearly depicts the declining trend of their traditional mode of subsistence i.e., shifting cultivation, which is locally called *bagad chas*. Normally a *bagad* plot is cultivated for three consecutive years and left fallow for 8-12 years for rejuvenation. Since its fertility and for that matter, the productivity decreases gradually for erosion of topsoil and its nutrients, the area under cultivation between the 1st and 2nd and 3rd *(asinal)* year decreases and so also the number of cultivator families. Thus the fertility factor depends on the soil quality, agro-climate and the regenerative fallow period. The more the fallow period, the better is the fertility. Now these conditions are deteriorating day by day. The consequences are visible in the data presented in the above statement.

- There is gradual reduction in the cultivated area and the number of farmers from the 1st year *(amengal)* to the 2nd and 3rd year *(asinal) bagado chas*.
- Over a period of 10-15 years, the over all quantum of production has decreased by 31 percent, the rate of decline being the maximum (-32.15 %)

ITEMS	ANNUAL YIELD (Approx in Qtls) Average per Acre (Growth Rate) / Average per Farmer							
	1st Year *(Amengal)*		2nd Year *(Asenal)*		3rd Year *(Asenal)*		TOTAL	
Total Area (Aprox in Acs)	62.75		33.10		32.80		**128.65**	
Number of Farmers	37		36		27		**100**	
Average Area per HH (Ac)	1.69		0.92		1.21		**1.29**	
Cropping Pattern	Past	Present	Past	Present	Past	Present	**Past**	**Present**
Cereals *Kangu, Ganga, Ghantia Suan, Ragi, Jana,*Maize	106.05	72.80	38.65	27.97	18.40	12.95	**163.10**	**113.72**
	1.69	1.16 (-31.36)	1.17	0.84 (-28.21)	0.56	0.39 (-30.36)	**1.27**	**0.88 (-30.71)**
	2.87	1.97	1.07	0.78	0.68	0.48	**1.63**	**1.14**
Pulses *Kandul, Jhudunga,* Pea, *Bargudi,* Black gram, Horsegram, Greengram	34.30	21.95	10.35	7.40	5.28	3.33	**49.93**	**32.68**
	0.55	0.35 (-36.36)	0.31	0.22 (-29.03)	0.16	0.10 (-37.50)	**0.39**	**0.25 (-35.90)**
	0.93	0.59	0.29	0.21	0.19	0.12	**0.50**	**0.33**
Oilseeds Til, Castor, Mustard,	17.65	11.40	6.40	4.70	3.10	2.35	**27.15**	**18.45**
	0.28	0.18 (-35.71)	0.19	0.14 (-26.32)	0.09	0.07 (-22.22)	**0.21**	**0.14 (-33.33)**
	0.48	0.31	0.18	0.13	0.11	0.09	**0.27**	**0.18**
Spices Turmeric, Ginger, Cinnamon*, Chilies,	4.77	2.92	2.17	1.60	1.64	1.06	**8.58**	**5.58**
	0.08	0.05 (-37.40)	0.06	0.05 (-16.67)	0.05	0.03 (-40.00)	**0.07**	**0.04 (-42.86)**
	0.13	0.08	0.06	0.04	0.06	0.04	**0.08**	**0.05**
Vegetables Pumpkin, Cucumber, *Kankad, Ghiagerda, Maragudi, Gadagai*	14.70	11.55	6.40	5.50	3.60	2.63	**24.70**	**19.68**
	0.23	0.18 (-21.74)	0.19	0.17 (-10.53)	0.11	0.08 (-27.27)	**0.19**	**0.15 (-21.05)**
	0.40	0.31	0.18	0.15	0.13	0.09	**0.25**	**0.19**
Total	**177.47**	**120.62**	**63.97**	**47.17**	**32.02**	**22.32**	**273.46**	**190.11**
	2.83	**1.92 (-32.15)**	**1.93**	**1.42 (-26.42)**	**0.97**	**0.68 (-29.89)**	**2.13**	**1.48 (-30.52)**
	4.79	**3.26**	**1.77**	**1.31**	**1.18**	**0.83**	**2.73**	**1.90**

Farmers' Major Perceived Reasons for the Production Downslide				
Soil Fertility Declining	28 (75.67)	17 (47.22)	17 (62.96)	62 (62)
Erosion of Fertile Soil	17 (45.95)	16 (44.44)	15 (55.55)	48 (48)
Inadequate & Erratic Rainfall	19 (51.35)	19 (52.77)	12 (44.44)	50 (50)
Shorter Fallow Period	16 (43.24)	10 (27.78)	16 (59.25)	42 (42)

Underlined crops are no longer cultivated

* Marked crop recently introduced.

in the 1st year followed by those in the 3rd year (-29.89 %)and then in the 2nd year (-26.42 %).

- Looking at the negative growth rate of yield for all the three successive years of cultivation of different categories of crops it is found that it is the highest (-42.86 %) in case of spices like Turmeric, Ginger, Cinnamon, Chilies etc. Next in the descending come the pulses (-35.90 %), oilseeds (-33.33 %), cereals (-30.71 %) and the lowest being the vegetables (-21.05 %).
- Huge decline of yield is noticed in the 1st Year *bagado* for spices (-37 %), pulses and oilseeds (-36% in each case); in the 2nd Year *bagado* for pulses (-29%), cereals (-28%) and oilseeds (-26%) and in the 3rd Year *bagado* for spices (-40%), pulses (-38%) and cereals (-30 %). It shows that spices, cereals and pulses are the worst affected crops during all the three-year cycle of *bagado chas*.
- For spices, pulses, and vegetables the highest decline is seen in the 3rd Year *bagado*.
- For declining fertility of *bagado* cultivation of a variety of crops have been stopped.

Peoples' Response on Causative Factors

As evident from the Statement, largest number of shifting cultivators (62%) knows that the yield from their *bagado chas* is declining with the decline of soil fertility. 50 percent of them attribute this to uncertain agro-climate with inadequate and irregular rainfall; 48 percent, to soil erosion and 42 percent, to shorter fallow period.

The time of fallow period varies with the subsistence need and the socio-economic status of the farmer as it determines the extent of his dependency on *bagado chas* be it profitable or not. A poor farmer with limited means of livelihood has no choice other than exploiting whatever *bagado* he possesses more frequently to keep his body and soul together than a well-to-do farmer. So he cannot afford to leave his *bagado* fallow for regeneration for a longer period. In the past the fallow period for poor Saora farmers were 5-8 years and for the well to do it was 7-12 years as the land man ratio was better for smaller population. The situation has changed over period of time. The fallow period has been coming down to 3-5 years and 5-8 years for both the categories of farmers.

Many hill slopes are now degraded for continuous exploitation and become unfit for *bagado chas*. These are coming under cashew plantation, which is a popular progamme for its profitability. The people are aware of the fact that the deteriorating ecological conditions would hardy sustain their traditional *bagado chas* but the poorer among them have little choice.

Firewood Collection

The Lanjia Saora generally collect firewood for their own consumption from their Bagado and surroundings. In the past, vegetations existed almost in their backyards. In an average they were to move within a radius not exceeding one kilometer to gather fuel for their kitchen. With gradual destruction of vegetations and degradation of their Bagado this distance has been increasing day by day. Now it has increased to more than 2 kms for the people of the study villages. Obviously this distance increases in the summer months more than those of monsoon and winter days.

Season	Average Distance Covered (kms)		Engagement No of Persons / Mandays =Average per Person				Quantity (Qtls) Total Quantity / 100 Households = Average per Household / (Rate of Decline)				
			Collection		Processing		Collected		Consumed		Sale/ Barter
	Past	Present	Men	Women	Men	Women	Past	Present	Past	Present	
Summer	1	2.5	146	174	141	171	515	322	455	320	Lanjia Saora do not Sale Fire Wood They gather only to meet consu-mption needs
			2123	2113	678	511	5.15	3.22	4.55	3.20	
			14.54	12.14	4.81	2.99		(-37.47)		(-29.67)	
Winter	1	2	146	174	143	174	781	580	760	571	
			1631	2089	895	717	7.81	5.80	7.60	5.71	
			11.17	12.01	6.26	4.12		(-25.74)		(-24.87)	
Monsoon	0.80	1.75	146	174	145	167	992	834	851	821	
			1176	1923	510	517	9.92	8.34	8.51	8.21	
			8.05	11.05	3.52	3.09		(-15.93)		(-3.52)	
Total	0.93	2.08	146	174	143	170	2288	1736	2066	1712	
			4930	6125	2083	1745	22.88	17.36	20.66	17.12	
			33.76	35.20	14.57	10.26		(-24.13)		(-17.13)	

- The data presented above indicates that both the sexes shoulder the burden of firewood collection almost equally with small seasonal variations.
- For processing the firewood i.e., chopping, splitting and slicing the stock in order to make it ready for use, men are more engaged than women in all seasons.
- With depletion of the vegetations, the quantity of annual collections and domestic consumption per study households has come down by -24 percent and - 17.13 percent respectively within last 10 - 15 years.

- Any shortage in firewood is substituted by farm refuses e.g., crop residues, dry leaves etc.
- Though the people know about the demand-supply gap, it has not yet turned so acute. They also understand that with the receding tree line and increasing population the firewood is going to be scarce in future. Their womenfolk who have to keep their hearths burning are more alarmed than their men about the impending crisis.

Collection of MFP

Minor Forest Produce (MFP) is deemed to include all items of forest produce except timber. The Dhebar Commission (1961), Hari Singh Committee (1967), the National Commission on Agriculture (1976) and several others have emphasized on development of MFP for the benefit of tribals. According to the National Commission on Agriculture, MFP possesses the potential of an economic revolution among tribals.

The consumption pattern of tribals indicates that the MFP items constitute important source of sustenance. The MFP provides raw material for their cottage industries. During drought and adverse climatic condition, tribals' dependence on MFP increases. In the area where job opportunities are few and viable economic alternatives are all but non-existent, this dependence on forest based subsistence activities is significant. Their subsidiary occupation involves total dependence on MFP for survival for at least three lean months in a year. But it is crucial in an economy of subsistence and survival. A study conducted in 1978 by Administative Staff College of India, Hyderabad, showed that between 10% to 55% of the income of a tribal family in Madhya Pradesh, Odisha, Bihar and Andhra Pradesh, came from MFP, the rest being derived from agriculture, shifting cultivation, horticulture, animal husbandry, wage earning etc. The present study endorsees the same, more or less, in case of the Lanjia Saora of Puttasing area.

As forest dwellers the Lanjia Saoras derive a part of their subsistence out of forest based activities. Their consumption needs are met to a large extent from forest collections round the year. They collect an endless variety of seasonal minor forest produce like small timber, bamboo, thatching grass, fodder, fruits, roots, seeds, tubers, mushrooms, leaves, flowers, fibers, leaves, barks, herbs, etc to supplement their diet and other requirements. With depletion of forests these items are in short supply and there are also other difficulties, which is evident from the statement presented below.

Type of MFP English Name / LocalName	Collection Time & Season	Average Distance Covered (kms)		Engagement Total Mandays /Total Persons / Average per Person				Quantity (Approx. in Qtls) Total / Number of Households / Average per Household					
				Collection		Processing		Collection		Consumption		Sale / Barter	
		Past	Present	M	W	M	W	Past	Present	Past	Present	Past	Present
1	2	3	4	5	6	7	8	11	12	13	14	15	16
Small Timber *Sargi, Piasal, Sisu, Bahada, Harida, Aam Gambhari, Mohul, Karad*	Summer Winter Monsoon	3 2 -	5 4 -	380	-	530	-	456	307	411	329	nil	nil
				134	-	91	-	77	82	91	91		
		2.5	4.5	2.83	-	5.82	-	5.92	4.44 (-25)	4.52	3.61 (-20.1)		
Bamboo	Summer & Winter	5.87	10.2	341	363	223	254	2285 Nos	1774 Nos	2221 Nos	1792 Nos		
				142	162	152	182	100	100	100	100	-	-
				2.4	2.24	1.47	1.39	22.85	17.74 (-22.4)	22.21	17.92 (-19.3)		
Grass (Non Fodder) *Allang, Raalu*	Summer & Winter	1.45	9.45	194	126	165	224	421	327	421	327	-	-
				147	163	147	163	89	73	89	73		
				1.32	0.77	1.12	1.37	4.89	4.48 (-22.3)	4.89	4.48 (-22.3)		
Fodder	Winter Monsoon	0.99	2.21	783	845	823	1078	634	491	634	491		
				141	152	89	124	93	81	93	81		
				5.55	5.56	9.25	8.69	6.82	6.06 (-22.5)	6.82	6.06 (-22.5)		
Barks *Siali, Kumbri Talangeng, kandrudal, Radelud, Baruda, Suger*	Summer Winter Monson	2.91 2.56 1.88 2.45	3.22 2.87 2.45 2.84	210	279	134	151	11.52	7.70	11.13	8.45		
				117	159	96	123	91	78	95	86		
				1.79	1.75	1.39	1.23	0.12	0.09 (-25)	0.11	0.09 (-18.2)		
Plants / Creepers *Siali, Radelud Talangeng*	Summer Winter Monsoon	2.85	4.08	129	232	112	227	5.78	3.99	5.56	4.76		
				116	169	72	144	89	81	94	87		
				1.11	1.37	1.55	1.57	0.06	0.05 (-16.7)	0.05	0.05 (-0.0)		
Fruits *Aam, Kusum, Anla, Bahada, Jamu, Harida, Kendu, Karanj, Jangingel, Tol, Char, Tentuli*	Summer Winter Monsoon	1.88	3.92	596	653	285	482	174.24	104.42	151.7	97.75	22.6	6.7
				146	164	143	164	98	95	100	99	57	39
				4.08	3.98	1.99	2.82	1.78	1.09 (-38.8)	1.52	0.98 (-35.5)	0.4	0.17 (-57.5)
1	2	3	4	5	6	7	8	11	12	13	14	15	16
Roots & Tubers *Marpudigai, Gadagai, Darugai, Patadgai, Ranikanda, Kathakanda, Pitakanda*	Monsoon	1.66	5.56	321	461	172	398	36.80	26.85	31.5	28.78		
				137	168	95	161	96	91	98	99		
				2.34	2.74	1.81	2.47	0.38	0.29 (-23.7)	0.32	0.29 (-9.37)		
Leaves *Sargi, Mohul Siali, Kirido, Kandrumdalo, Bradajop, Adrangjop, Tibmlarangjop, Urbangdjop, Samalia*	Winter Monsoon	1.31	3.3	188	315	105	175	12.65	8.38	11.35	9.83		
				101	153	78	103	94	99	97	100		
				1.66	2.06	1.38	1.7	0.13	0.08 (-38.5)	0.12	0.1 (-16.7)		

Flowers *Mohul*	Summer	1.28	3.14	181	225	174	321	36.15	31.17	24.18	25.98	11.97	5.10
				96	132	93	129	85	81	77	89	61	42
				1.88	1.70	1.87	2.49	0.43	0.38 (-11.6)	0.31	0.29 (-6.45)	0.19	0.12 (-36.8)
Seeds *Tol, Sarja, Bansbhalia, Karanj, Neem*	Summer	1.42	3.70	272	306	208	311	25.85	17.49	21.04	14.01	4.81	3.48
				128	137	132	151	98	95	99	97	37	39
				2.12	2.23	1.57	2.06	0.26	0.18 (-30.8)	0.21	0.14 (-33.3)	0.13	0.12 (-7.7)
Mushrooms *Sargio, Dasra Jamu, Sraban Baunc,Alenga Taraphul, Bali Atampat*	Monsoon	2	4.69	119	454		305	14.48	9.35	13.35	11.53		
				103	167		97	100	98	97	100		
				1.15	2.72		3.14	0.14	0.09 (-35.7)	0.14	0.12 (-14.3)		
Herbs *Srujel, Dunre Manjuati, Arka Barad, Kumbri Raktukotta Kdabdara*	Summer Winter Monsoon	1.71	4.70	272	311	167	293	4.25	2.41	4.15	2.67		
				119	153	103	137	77	63	87	89		
				2.28	2.03	1.62	2.14	0.05	0.04 (-20)	0.05	0.03 (-40)		
Resin *Desedai*	Summer	1.67	5.02	78	212	154	213	4.47	2.63	3.17	2.81		
				81	103	94	103	63	57	59	61		
				0.96	2.05	1.63	2.07	0.07	0.05 (-28.6)	0.05	0.04 (-20)		
Gums *Bel, Panas, Aswastha Mohul*	Summer Winter Monsoon	0.96	4.03	43	139	52	88	0.76	0.51	0.73	0.48		
				107	131	77	139	47	49	45	48		
				0.40	1.06	0.67	0.63	0.02	0.01 (-50)	0.02	0.01 (-50)		
Broom stick *Janon*	Winter	1.63	4.58	91	227	53	232	10.39	5.80	8.82	4.96	1.57	0.84
				103	163	27	86	87	84	84	80	13	11
				0.88	1.35	1.96	2.7	0.12	0.07 (-41.7)	0.1	0.05 (-50)	0.12	0.07 (-41.7)
Others (Specify) *Tabang*	Monsoon	5.87	10.2	62	213		102	9.63	5.96	9.16	5.07		
				43	117		71	57	53	51	55		
				1.44	1.82		1.43	0.16	0.11 (-31.3)	0.18	0.09 (-50)		
TOTAL				**34.19**	**35.43**	**35.1**	**37.9**	**1857.97**	**1351.48**				

Of much greater importance than income from sale is their need for MFP in their daily lives. The Lanjia Saora of the study area mostly collect MFP to meet the own consumption needs. Out of so many items they collect, only the a few surplus items of fruits, flowers (Mohul), seeds and broomsticks, as given in the above Statement, are sold out after meeting their domestic requirements. All of them depend on MFP for a major portion of their food and for their cattle, fodder and other needs.

In a country in which modern health care is not accessible to the rural inhabitants in general and the rural poor in particular, the tribal have to depend on wild medicinal shrubs, herbs, roots and fruits from the forest. When all these things are added, one can see how dependent the forest dwellers are on MFP for their very existence.

Being forest dwellers they certainly need some bamboo and timber for their houses, agricultural implements and fences. But their needs are minimal compared to the raw material requirements of commerce and industry, which is a major cause of deforestation.

In terms of employment, collection and processing of MFP keeps them engaged for almost two and half months in a year. Sex wise the women are little more engaged i.e., average 73 man days in a year than men whose average annual per capita engagement in this trade is found to be 69 man-days.

Our data thus show the link between deforestation and reduced availability of MFP, additional workload and greater hardship. Because of the non-availability of MFP, the forest dwellers require much more human power to collect even the minimum required for survival.

The distance between the MFP collectors and the source i.e., the forest has increased in the mean time between past 10-15 years and the present for all items. That brings about the hardship to cover larger distance and spend more time in this activity.

The Lanjia Saora women shoulder the responsibility of collecting the MFPs more than men. Therefore this section of the population undergoes the maximum hardships because of deforestation. Today, given the distance of the forest from the village, they have to walk for an additional 3 to 4 hours a day to collect MFP. This, to some extent turns their otherwise difficult work at home into a secondary occupation. But they continue to walk this distance and also work at home in order to survive.

The reduction in the procurement of MFP between past and present is visible in all categories. The highest decline is in gums (-50 %), followed by broomsticks (-42 %), seeds, fruits and leaves (-39 % in each case), and the lowest, being in flowers (- 12 %). For other categories the rate of decline ranges between 16 percent and 36 percent. As a result their average household consumption of all these items have come down by 50 percent to 9 percent and created deficits by imbalancing the equation of demand and supply.

Most of our respondents kept repeating that the problem itself is the result of deforestation and the consequent lack of access to MFP. The data given above seem to confirm this. The first indication is the difference between the past and the present

in the collection, consumption and sale of MFP. This is attributable primarily, if not exclusively, to the difference in the forest area available and the consequent difference in access.

Possession of Livestock

The Lanjia Saora rear certain kinds of animals to meet their agricultural and consumption needs. When natural vegetations were abundant there was hardly any problem to maintain their domestic animals. Now the population of these animals is decreasing with depletion of forests and decline in agricultural production. This diminishing trend is visible in the comparative data presented in the following statement.

Types of Animals	*Number*		*Reasons for Change (Percentage of Response)*				
	Total Animals / Total Households possessing / Average per Household		Shrinkage of Grazing Sources	Shortage of Fodder	Drying up of Water Sources	Shortage of Manpower for tending Livestock	Fear of Taboos & Social Sanctions
	Past	**Present** (Growth Rate)					
Bullocks	330	252 (-23.64)	81.18			18.82	
	88	85					
	3.75	2.96					
Buffaloes	23	12 (-47.83)	66.67		83.33		
	10	6					
	2.3	2					
Cows	141	89 (-36.87)	58.97	38.46	23.07	17.94	
	45	39					
	3.13	2.28					
Goats	178	97 (-45.51)	78.57	32.14		21.43	46.42
	43	28					
	4.13	3.46					
Pigs	160	35 (-78.13)			26.83		65.85
	41	14					
	3.90	2.5					
Poultry	548	341(-37.77)	34.57 % premature death for unknown disease				
	81	76					
	6.76	4.48					
Total	**1380**	**826 (-40.14)**	**71.35**	**35.30**	**44.41**	**19.39**	**56.13**
	100	**100**					
	13.80	**8.26**					

- The animal population has decreased significantly (- 40.14 %) with the average livestock per household shrinking from 14 to 8 animals over last 10 - 15 years.

- The highest negative growth rate (-78.13 %) is recorded in case of pigs followed by buffaloes (-47.83 %) and cows (-45.51 %), the lowest (-23.64 %) being the bullocks.
- The people revealed the reasons for this situation. The largest number (71.35 %) of respondents cited about shrinking of sources for grazing the animals along with drying up of water sources and short supply of fodder caused by deforestation. Particularly, the populations of buffaloes, cows and goats have been affected by these factors.
- Pig rearing that has been quite common in the past has suffered a major set back on the advent of Christianity. Christianized Saoras are tabooed against this practice.
- The village councils in some villages have restricted goat rearing in order to protect the economic cashew plantations, which have started in a big way over past decades.

Indebtedness & Bondage

It is a well-known fact that the deficit caused by decline of traditional forest based subsistence activities on account of deforestation drives the gullible tribals into the vicious circle of indebtedness and bondage. Once a tribal incurs debt from a local *sahukar* (money lender), he is trapped in a net from which he cannot wriggle out very easily. He and his children live in debt and die in debt. Indebtedness in most cases leads to bondage and land alienation. The exorbitant rates of interest charged by the local private moneylenders makes the repayment of loan impossible and invariably the cunning moneylender deprives the client of his income from his available sources of land, MFP and other produces and finally acquires the client's land and or other valuable economic assets. The worst victims are the poorer and landless sections who have no other options.

This kind of situation was prevailing in the study area till the recent past. But now, thanks to the tribal and rural development programmes, the circumstances have changed. Nationalised Banks and Self Help Groups (SHGs) have come to their rescue overshadowing the dishonest private lenders. The level of awareness of the people has also increased.

The above statement shows that presently, Indian Bank, State Bank of India and SHGs have advanced fairly larger amounts of loans to the people than the local

Source	Number of Loanee Households	Position of Indebtedness				
		Total Amount of Loan Taken (Rs) / Average per Household	Total Amount Repaid (Rs) / Average per Household	Total Amount Outstanding / Average per Household (Rs)	Whether Land or any economic Asset alienated for repayment	If Indebtedness caused Bondage
State Bank of India	2	4 000 / 2 000	Nil	4 000 / 2 000	Land	No
Indian Bank	13	5 39 533 / 41 502.5	3 23 400 / 24 876.9	2 16 133 / 16 625.6	Land	No
Self Help Group	2	9 500 / 4 750	Nil	9 500 / 4 750	Nil	No
Private	2	6 400 / 3 200	3 400 / 1 700	4 500 / 2 250	Nil	No
Total	19	**5 59 433 / 29 443.8** (100)	**3 26 800 / 17 200** (58.42)	**2 34 133 / 12 322.7** (41.58)		

moneylenders. The position of repayment of loans by the loanees is also good i.e., 58. 42 percent. Large inflow of institutional finance has pushed the greedy private financers to the backstage, removing their grip over the vulnerable sections. As a result there is not a single case of bondage and alienation of land or any valuable economic asset to the private lenders on account of indebtedness.

The data on average annual income of the study households presented in the above Statement is self-explanatory. Between past and present, the average income rose by 45.78 % whereas the expenditure has gone up by 47.55% increasing the deficit in household budget.

The highest component of income i.e., 29.84 percent in the past and 28.89 percent in the present comes from settled agriculture including terraced cultivation of paddy and mixed cultivation in up and dry lands. Yet there is one percent fall between then and now for decline of the rate of production.

Following settled agriculture, the second highest income is reported from both the sub-sectors of horticulture combined together i.e., backyards & kitchen garden and other horticultural plantations including mixed orchards and cashew plantations in backyards, wastelands and *podu* ravaged hill slopes. While the income

Household Income

Sl. No.	Sources of Income	Average Amount of Annual Income (Rs)	
		Past (10 Years)	Present
1.	Agriculture	4 09 168 (29.84%)	5 77 634 (28.89 %)
2.	Shifting Cultivation	1 57 103 (11.46%)	1 23 657 (6.19%)
3.	Horticulture (a) Orchard etc.	1 78 592 (13.02%)	3 54 705 (17.74 %)
	(b) Backyard & Kitchen Garden	82 895 (6.05 %)	1 09 650 (5.48 %)
4.	Animal Husbandry	25 865 (1.89 %)	18 985 (0.95 %)
5.	Forest Collection	2 03 295 (14.82%)	2 18 577 (10.93 %)
6.	Hunting	5 810 (0.42 %)	1 775 (0.09%)
7.	Fishing	1 476 (0.11%)	1 110 (0.05 %)
8.	Wage and Labour	1 51 275 (11.03 %)	3 03 035 (15.16 %)
9.	Rural Industry	1 680 (0.12%)	2 050 (0.10 %)
10.	Trade / Barter	4 350 (0.33 %)	6 575 (0.33 %)
11.	Gift / Exchange	17 135 (1.25 %)	33 495 (1.67%)
12.	Service	1 32 695 (9.68 %)	2 47 855 (12.40%)
	Total	13 71 339 (100 %)	19 99 103 (100 %)
Average per Household (Growth Rate)		13 713. 39	19 991. 03 (45.78 %)

from backyards & kitchen garden sub-sector have marginally decreased from 6.05 percent to 5.48 percent, that from mixed orchards and cashew plantations etc. have registered a significant growth from 13.02 percent to 17. 74 percent. Both the sub-sectors taken together, the total contribution of horticulture sector to household income has risen from 19.07 percent to 23.22 percent negating the trend of decline in other sectors. As mentioned earlier, this is happening for the popular acceptance of modern horticultural programmes by the people in general and the spread of cashew plantations in particular.

Forest collections constituted the third largest source of household income (14.82%) in the past. With gradual depletion of forest resources over period of time, the quantum of income from this age-old perennial source has been reducing day by day down grading its position to the 5th (10.93 %) below that of wage and labour (15.16 %) and service (12.40%) which were in the 5th and 6th position in the past. That means following the decline of forest resources, people are looking for

alternatives in other avenues like wage earning to supplement their income and make up the deficit.

Like that of forest collections another important age-old forest based source of subsistence ie, the shifting cultivation has been declining. Consequently its contribution to household income has come down from 11.46% to 6.19% over past 10-15 years downgrading its rank from 4th to 6th.

Moreover, deforestation and the ban on hunting have affected the incomes from allied sectors like animal husbandry hunting and rural industry that is largely dependent on forest produce. While animal husbandry has gone down from the 7th t0 8th position and the hunting, from 9th to 11th position, rural industry has improved its rank from the 11th to 10th, but its share has gone down from 0.12 percent to 0.10 percent. In case of hunting the income has reduced by almost 80 percent making it a mere ritual activity and for animal husbandry the rate of decline is about 50 percent.

Fishing has never been a significant economic activity for the Lanjia Saora. In terms its contribution to household income it is negligible. As such it holds the lowest rank in the past as well as in the present. This too has declined by more than 50 percent.

Thus it is found that the shares of earning from large number of economic sectors i.e., 7 out of total 12 has declined over past 10-15 years. Sectors like shifting cultivation, animal husbandry, forest collections, hunting and fishing have registered major decline and the remaining 2 i.e., agriculture and rural industry have shown marginal decline. Conversely, significant growth of income has been reported from sectors like horticulture, wage earning and service and marginal growth, from gift and exchange. Interestingly, there is no change in the income from trade and barter which has remained constant at 0.33 percent though its rank has moved up from the 10th to 9th during this period.

Household Expenditure

The data on average annual expenditure of the study households presented in the following statement speaks for itself. The quantum of expenditure has increased on all the 18 heads.

Among all the heads the highest average household expenditure has been made on fooding and the second highest on, house construction and maintenance and as such both have maintained their 1st and 2nd positions not only in the past but also in the present circumstances. A decade ago the total share of expenditure on both the heads accounted for (30.43% + 23.84% =) 54..27 percent of the all-total average household expenditure. This has marginally increased to 57.53 percent at present. Always it has remained over 50 percent.

The expenditure on payment of land revenue has been the lowest among all the heads. Consistently, it has held the lowest i.e., the 18th rank then and now.

Expenses on agriculture, shifting cultivation and horticulture has come down in percentage terms i.e., from 7.1 %, 7.25 % and 7.25 % in the past to 5.69 %, 5.32 % and 4.12 % respectively in the present. While agriculture and horticulture have retained its 4th and 7th ranks respectively, shifting cultivation had stepped down from its 3rd rank to 5th rank indicating its decline from the position of a major traditional subsistence activity.

Besides that, the other heads, which have held their ranks consistently over period of time, are dress & ornaments (6th), rituals & festivals (8th), education & training (10th), treatment of diseases (12th) and rural industry (17th). However in percentage terms their share has changed nominally both on the positive and negative side except that of rural industry, which has remained constant at 0.19 percent.

The study households are not only spending more on construction and improvement of their houses, they have also raised their expenditure for acquiring modern and durable assets. This has caused the upgradation of rank of the head for purchase of durable assets from 11th to 9th while in its share has increased from 1.95 percent to 3.17 percent.

The data establishes a trend: the pattern of average annual expenditure of the Lanjia Saora study households have not changed much over the past decade. Yet signs of modernization are visible in increased spending on house construction and maintenance, acquisition of durable household assets, treatment of diseases, gift and exchange, education and training and fooding.

The fact remains that; traditionally their life depended upon balanced utilization of natural resources. This balance is disturbed by deforestation. As the things stand today, the situation looks grim but not worse.

Sl. No.	Heads of Expenditure	Average Amount of Annual Expenditure (Rs)	
		Past (10 Years)	Present
1.	Agriculture	97 967 (7.1 %)	1 15 832 (5.69 %)
2.	Shifting Cultivation	99 895 (7.25 %)	1 08 176 (5.32 %)
3.	Horticulture	61 390 (4.45 %)	83 745 (4.12 %)
4.	Rural Industry	2675 (0.19 %)	3 780 (0.19%)
5.	Dress & Ornaments	67 423 (4.89%)	96 751 (4.76 %)
6.	Rituals & Festivals	53 875 (3.91%)	67 386 (3.31 %)
7.	Drinks & Intoxicants	17 810 (1.29 %)	23 765 (1.17 %)
8.	Entertainment of Guests	16 905 (1.23 %)	28 185 (1.38 %)
9.	Treatment of Diseases	19 785 (1.43 %)	33 190 (1.63%)
10.	Education & Training	27 885 (2.02 %)	49 638 (2.44 %)
11.	Purchase of Durable Assets	26 870 (1.95%)	64 584 (3.17 %)
12.	Land Revenue	719 (0.05 %)	1 219 (0.06 %)
13.	Construction & Repair of House	3 28 690 (23.84%)	5 18 875 (25.50 %)
14.	Litigation	9 300 (0.67 %)	8 500 (0.42 %)
15.	Gift & Exchange	28 655 (2 08 %)	47 680 (2.34 %)
16.	Fuel & Fodder	5 714 (0.41 %)	8 753 (0.43 %)
17.	Fooding	4 19 635 (30.43 %)	6 51 655 (32.03 %)
18.	Repayment of Loan	93 600 (6.79 %)	1 25 800 (6.18 %) 3
	Total	13 78 793 (100 %)	20 34 514 (100 %)
	Average per Household (Growth Rate %)	**13 78 793**	**20 34 5. 14 (47.55%)**

Since generations the Saora have been living in their remote mountainous abode deriving subsistence from the resource bases of the hills and forests. Employing crude and labour intensive methods and a small number of simple implements they were satiating their small needs and making a bare minimum living. The main modes of living devised and adopted by them were swidden cultivation, hunting and food gathering. In those days, the nature's bounty was abundant and the population was small. So long as the hilltops and hill slopes were having verdant forest growth, the Saora were exploiting the hills and forests with mirth and furry and *bagado chas* was their way of life. Establishing small settlements nearer to the swidden fields was the practice; and moving the settlement site alongside moving into virgin swidden

plots was the norm. As forests started receding swidden cultivation and forestry did not pay dividends and the Saora started preparing terraced fields for paddy cultivation. They learnt in a hard way that their age-old mode of subsistence would no longer sustain their growing population. They also sought alternatives in horticulture and seasonal migratory labour.

Experiencing the environmental hazards of deforestation on their livelihood pattern and culture, they have realized the indispensability of restoration of the degraded natural environment around their habitat for which they are willing to contribute their part actively by planting commercial as well as traditional species in their surroundings and degraded swiddens. This is a welcome trend and a positive sign. The popularity of cashew and other horticultural programmes bear testimony to that.

SUMMARY FINDINGS

Background

Today a serious matter of worldwide concern is the phenomenon of degradation of the natural environment as a direct consequence of deforestation precipitated by a situation of over-exploitation of natural resources. Large tracts of moist tropical vegetations are disappearing fast from the earth's surface day by day. Now more than anybody else, the tribal folks who have been the denizens of forest since time immemorial stand at the receiving end of the disaster as the worst victims.

Tribal communities living close to the nature since the hoary past have developed a symbiotic relationship with the forest. They depend heavily on the forest for their livelihood, shelter, occupation and employment. To them forest is not merely a perennial and renewable natural resource for fulfillment of their basic needs but also the very foundation of their culture exemplifying the age-old serene pattern of coexistence between man and nature. Their folklore, religion and worldview are woven round the forest. Therefore their social and economic well being can not be ensured ignoring their dependency on the forest eco system.

In India this age old harmony of man with nature has been affected since the time of colonial administration. The major reasons are population growth, industrialization and urbanization, development and especially the commercial exploitation of forest resources based upon the policy of treating the forests as national wealth and its continuance even after independence. This has started a trend of massive deforestation on one hand and erosion of age-old traditional rights of the tribesmen and their nature of relationship with the forest on the other making them the worst victims of deforestation. The Orissan tribes are no exception.

The gravity of the situation of deforestation can be assessed from the fact that, at the time of independence nearly one fourth (23%) of India's land area was under forest cover and now it has come down to less than one tenth. It is said, India has been loosing on an average 1.3 million hectares of forests every year. In absolute terms of the extent of the area of deforestation, Orissa comes among the top three most affected states. Forests that covered nearly 40 percent of the state's land area has dropped below 20 percent.

In Orissa, the majority of forest dwelling tribals are socially, economically and educationally backward and relatively underexposed to the outside world. They live in the remote hilly areas, many of them primarily being dependent on shifting cultivation and minor forest produce (MFP). In other words, they depend on the forests for their very survival. Consequences of deforestation have subjected them to untold miseries and sufferings.

Present Study

With this backdrop this study has been undertaken to assess the effects of deforestation among a Particularly Vulnerable Tribal Group (PTG) i.e., the Lanjia Saora of Puttasing of southern Orissa who live in a simple society and inhabit remote forest areas in a state of semi-isolation and thrive upon a subsistence economy based on land and forest.

This exploratory study has covered one hundred households in 12 selected Lanjia Saora settlements located in Puttasing area of Rayagada district. The quantitative data on aspects like population, literacy, marital status, health status, occupations and employment, traditional skills, indebtedness, livestock, agriculture, horticulture and shifting cultivation, and collection of MFP, household income and expenditure pattern etc. has been collected by administration of a set of Household Schedules. Qualitative data, on socio-cultural, economic and environmental impact of deforestation has been gathered through personal interviews, group discussion, non-participant observation, interaction with key informants and community leaders and recording of case studies with the help of an Interview Guide. In both the ways an attempt has been made to elicit comparative data on important aspects of the problem as they were in the past, 10-15 years back and the changes, if any, occurred at present i.e., at the time of this study. Relevant secondary data has been elicited from available references.

The Study Area

The study area of Puttasing is a rugged, mountainous highland country predominantly inhabited by the Lanjia Saora. This picturesque territory with its undulating terrain, rolling hills, terraced paddy fields, perennial hill streams and patches of lush green forests lies at an average elevation of 2000' above the mean sea level. It froms a natural geographic unit, comprising fertile valleys of the Vamsadhara and its tributaries between the mountain ranges of the Eastern Ghats. The soil type is red laterite on the hills. Brown to black soil is seen on the hill bottoms and valleys.

Due to shifting cultivation and deforestation, soil erosion is evident on the denuded hills. The flora of this region is predominantly composed of moist peninsular Sal *(Shorea robusta)* forests in the valleys and hill ranges standing at an elevation of 590' to 5000'.

The contribution of forest to the economic life of the Saora is very significant. In the past the area was under thick forest cover, but now only patches of vegetations are left. It has been observed that while practising shifting cultivation, they spare fruit trees like Mohul, jackfruit, tamarind, mango, etc. This has given a clue to development agencies in dealing with the problem of shifting cultivation. Recently by the efforts of the micro project, LSDA, Puttasing, horticultural plantations and more particularly, cashew plantations have been raised on the wastelands and barren hill slopes.

In the past it was a wild country rich in natural wealth of flora and fauna. tigers, jackals, bears, Leopards, panthers, wild dogs, elephants, porcupines, Sambars, wild pigs and goats, fowls, spotted deers, barking deers, common langur and bander, bonnet monkey, peacocks, pythons, cobras were roaming in the wilderness. Now the fauna is almost depleted with the forest.

The climatic condition of the region is more like that of the Deccan plateau. Because of its elevation, the area experiences a mild and moderate climate, with a short and mild summer, moderate monsoon and a long winter. The spatial distribution of rainfall in this area is largely influenced by the Eastern Ghats.

The Tribe: Lanjia Saora

The Lanjia Saora represent a primitive section of the great ancient tribe "Saora" or "Savara". They are not only numerically important but also a historically and culturally significant tribal community of the State. According to a legendary tradition, they have been intimately associated with the cult of Lord Jagannath, who originated as a tribal deity and was later brought to Puri under royal patronage.

The tribe have their racial affinity with the proto-Australoid stock and speak an ancient Mundari dialect of their own called 'Sora'.

Numerically, a major Scheduled Tribe of Orissa, the **Saora** are found in almost all the districts of the State. But their main concentration lies in a contiguous mountainous territory of the Eastern Ghats in Rayagada and Gajapati districts in Southern Orissa, which can be called, the "Saora Country". Their population as per

1991 census was 4,03,510 accounting for 5.74 percent of the total tribal population of the state. Their decennial growth rate (1981- 1991) was 9.04 per cent and sex ratio, 1015 females per 1000 males in 1991 showing numerical superiority of their women over men. Educationally, they are backward with only 25.58 per cent literacy in 1991.

The exact population of the **Lanjia Saora** is not available. However according to an enumeration made by SCSTRTI on 2001-02, their population in the two Micro Projects areas viz, LSDA, Puttasing and LSDA, Serango is 7,587.

The Lanjia Saora are famous for their expertise in terrace cultivation, shifting cultivation, elaborately religious lifestyle, artistic skills for producing beautiful wall paintings or pictograms popularly known as icons and their peculiar traditional male dress-style in which the ends of the loin cloth hangs like a tail at the back. The term "Lanjia" meaning "having a tail" has been bestowed upon them by their neighbours referring to the fashion of wearing long tailed lion cloth by their male folk.

The subsistence economy of the Lanjia Saora rests primarily on slash-and burn agriculture and importantly on terrace cultivation. It is supplemented by wage earning and round the year forest collections. Individual ownership of the swidden plots is recognized on a hereditary basis. They exhibit a high degree of indigenous skill, ingenuity and technological outfit for preparing the terraces with inbuilt water management system. Mainly they grow rice in terraced fields and a variety of minor millets, cereals, and pulses in the swiddens. Among many remarkable features of their socio-economic life is their traditional system of labour cooperative called *ansir*, which ensures them supply of labour for labour intensive operations like swidden cultivation, house construction, terrace making and terrace cultivation, and other activities in the village.

The Saora social organization is distinguished by absence of exogamous clans. The main exogamous unit is the patrilineally extended family descended from a common male ancestor, called *birinda*. Women even after marriage continue to belong to the brother's *birinda*.

The Lanjia Saora pantheon includes numerous gods, deities and spirits, who are worshipped with fear and anxiety. People offer sacrifices for their safety and well-being. Most of the festivals revolve round agricultural cycle and lifecycle rituals. To commemorate the dead *Guar* is celebrated. In their society, the fear of religion is the most potent factor for ensuring social conformity and it acts as a powerful deterrent against breach of established customs.

Their aesthetic life manifests through colourful dance, music and the wall paintings, *anital*, in particular. The icons are so skillfully dreamt and drawn that these have made them famous among the scholars and artists of the country and aboard.

Their traditional village organization possesses, a well-defined territory, a hierarchy of responsible leadership and a traditional village council composed of family heads, called "Birinda Neti". There are a secular headman (Gomango/Naiko), a sacerdotal headman (Buya / Karji / Jani), headman's subordinates- (Mandal / Dal Behera), messenger (Barik), astrologer (Disari) and Shaman (Kudan / Beju). The village affairs are decided in village meetings held under the chairmanship of the Gomango. Decisions are reached mostly by consensus and not by majority vote.

In modern times, rapid changes in administrative set-up and political climate of the country and their exposure to the external modern world have influenced the Saora way of life and contributed to modernize their political organization. Various welfare measures initiated by the Government have also enhanced their contacts, outlook and awareness. The Lanjia Saora have been identified as a Particularly Vulnerable Tribal Group (PTG) in Orissa. For their all round development, two Micro Projects, one located at Puttasing in Rayagada district and another at Serango in Gajapati district have been established. The impact of the political change, election system, adult franchise and local self-government have triggered off various political processes and generated new leadership among them.

Impact of Deforestation on Environment

The forests as whole function as the biomass system that maintains the ecological balance to provide a life support system for the animal kingdom. This balance disappears with deforestation as it leads to environmental deterioration. Today the disastrous consequences of deforestation manifests in shapes of soil erosion due to inadequate tree cover, drought due to loss of ground water storage, floods due to run off water, and landslides due to the denudation of hills.

Now the Lanjia Saora of Puttasing, have come to realize that the destruction of forests leads to the deterioration of human beings, especially those belonging to the weaker sections like themselves who has been depending on nature for their very survival. Consequently, the environment degradation hits them harder than any other. Their community leaders have expressed such views during informal interviews and group discussions.

In their perception:-

- The area under forest coverage as well as the forest density has reduced very highly by 60-75 percent.
- Forests that surrounded their villages 2-3 decades back have receded 2-10 kms now.
- Deforestation has highly affected their natural environment. It is visible in deterioration of the soil through the ongoing process of soil erosion, loss of soil nutrients, fertility and moisture.
- The felling of evergreen trees with large leaves that protected land from the summer sun and retained soil moisture, leads to the lowering of the water table, reduction of moisture in the atmosphere and the consequent decrease in rain or erratic rainfall.
- The consequences the ecological imbalance hit them in shapes of, drying of water sources, unpredictable climatic conditions, rise in atmospheric temperature, flood and draught, acute shortage of drinking water, decrease in yield from agriculture and horticulture, scarcity of food for crop failure, shortage of fodder etc.
- The equation of their age-old dependence on the forest has been disturbed by deforestation.

Destruction of forests is not merely disappearance of trees but of the resource on which the tribal economy, culture, social life and religion depend. Consequently, the destruction of their habitant does not merely deprive them of their very life support system but sets a new destructive process in motion that is harmful to their life and culture.

Effects of Deforestation: Socio-Economic

Tribals are inseparable from forest not only ecologically but economically too. The denizens of forest traditionally depend on the forest flora and fauna for their livelihood and thrive on subsistence economy derived out of hunting, food gathering and shifting cultivation because they have few viable economic alternatives and employment opportunities. They collect various kinds of Minor Forest Produce (MFP) in different seasons and satisfy their numerous needs from the forest with the help of most simple implements and without any external technological aid.

Therefore it is now important to know how deforestation has affected their age-old dependence on the forest and its consequences.

Though, Orissa is comparatively rich in forest resources, the living standards of its people and especially the tribals is very low since, majority of the forest dwelling tribes are economically backward, pre-literate and underexposed to the outside world.

The Lanjia Saora have lived with the forest for centuries and built up a symbiotic relationship with forest in context of their social, cultural and occupational life. They inhabit clusters of villages mainly in the interior hilly areas, depending primarily on shifting cultivation and minor forest produce (MFP). As they have been depending on the forests for their very survival from time immemorial, wanton destruction of forests has not only disturbed the ecological balance but also put pressure on the diminishing forest resources. Consequently they find it difficult to pursue their traditional occupations and sustain their livelihood as their perennial source of subsistence is disintegrating in these days.

In this situation, it becomes imperative to understand the magnitude and direction of the impact of deforestation on the socio-economic condition and life of the tribals especially with reference to their occupational position, social and cultural life, living standard and economy as a whole.

The present study observes the socio-economic condition of the Lanjia Saora as affected by the consequences of deforestation.

Study Villages

The 12 study villages are inhabited exclusively by the Lanjia Saora. 11 of these are inside the micro project, LSDA area and the remaining one just lying on the periphery of the project area. 100 Lanjia Saora households belonging to these 12 villages/ hamlets were covered under the study.

Population, Marital Status & Literacy in Study Households:

The 100 study households have a total population of 662 including 322 males and 340 females showing an average household size of 6.6. It also shows the numerical superiority of females over males; the sex ratio being 1056 females for 1000 males.

Because the Lanjia Saora practise polygyny for a family badly needs more women workers for *bagado chas* (shifting cultivation) and other economic activities.

there are more married women (38.82%) than men (35.40%); more unmarried men (61.80%) than women (55.88%); Very low incidence of divorce (0.60%); very low incidence of separation involving women only (0.30%); and more widows (4.12%) than widowers (2.18%).

The Total Literacy (30.66%) and Female Literacy (17.35%) are low.

Skills & Occupational Pattern; Continuity & Mobility

Deforestation has caused deterioration of natural environment as well as their traditional life support system. Their dependence on traditional livelihood sectors such as, hunting, shifting cultivation, animal husbandry and forest collections have declined in course of time following the trail of deforestation.

Gradually, they have taken up pursuits like settled terrace cultivation to grow paddy, horticultural plantations and wage labour. Many Saora men possess traditional skills in stone bunding required for preparing terraces for paddy cultivation, dry and upland cultivation, horticultural plantation and water management.

Now the Lanjia Saora are exhibiting a trend of temporary seasonal migration, especially in the lean seasons, to far-off states like Maharashtra, Assam, Arunchal Pradesh etc to earn higher wages by their engagement in unskilled and semi-skilled avocations such as carpentry, masonry, plumbing, auto-driving, machine operation, construction workers, tea garden workers and the like.

Acquisition of modern skills in masonry, carpentry, photography, weaving etc. has been brought out by their mobility and exposure to the modern world when their dwindling natural resource base effected by deforestation pushed them forward to look outside for greener pastures. Obviously, men only possess these new skills because they move out leaving their women and children behind to take care of their home and hearth.

Nearly half of the population (48.34%) constitutes the Working Population in the age group of 15—59 years.

Corresponding to the sex ratio and marital status, women (51.17 %) maintain superiority over men (45.34 %), both numerically and percentage wise, in this segment.

Their average engagement in major avocations comes to less than half of a year. Being under-employed, they seasonally migrate outside in search of wage and employment

Sector wise, both the sexes spend the largest number of days in average in Shifting Cultivation followed by Terrace Cultivation, Forest Collection and Horticulture. Thus forest based subsistence activities, in combination of Shifting Cultivation and Forest Collection, still remains their major economic pursuit in terms of engagement for their age old dependence on forest.

In terms of average engagement in each and all of these avocations women work more (163 man days) than men (157 man days).

Agriculture

Agriculture is the mainstay of the Lanjia Saora economy. In recent times it has taken precedence over shifting cultivation – the traditional mode of their subsistence, which no longer remained profitable under the cumulative impact of deforestation, ecological imbalance and decline of land/man ratio due to pressure of growing population. Since cultivable land is in short supply in their area for undulating nature of the hilly terrain, they have found an answer to this problem by mastering the art of preparing and cultivating terraced paddy fields on the lower hill slopes and bottoms, which they call 'Saroba'. They exhibit a high degree of indigenous skill, ingenuity and technological outfit for preparing the terraces with inbuilt water management system.

Yet, they still have to continue with shifting cultivation (Bagado) to supplement their earnings. Mainly they grow rice in terraced fields and a variety of minor millets, cereals, pulses, oilseeds and vegetables in the swiddens (Bagado) and Baseng: the up and dry land. Thus they possess three kinds of farmlands – (i) Saroba, (ii) Baseng and (iii) Bagado.

Cultivable Land Holding Pattern

Cultivable lands include all kinds of farmlands excluding the swiddens.

Among the 100 study households, only 3 (3%) are landless.

Small Farmers form the majority group (38.14 %) among all categories followed by that of Medium Farmers (23.71 %). The bulk (60 %) of the landowning households fall under Marginal and Small Farmers category. The Big Farmers are in minority (16.49 %).

The average size of landholding per landowning household is 2.73 Acs. For the Marginal, Small, Medium and Big Farmers it is 0.64 Acs, 1.74 Acs, 3.54 Acs and 6.61 Acs respectively.

Trend of Agricultural Production

Saroba, the terraced paddy fields, are their valuable productive assets. Almost all the study households (97%) possess Saroba in an average of 1.63 Acres per farmer household. Where adequate water for irrigation is available they raise a second paddy crop in Saroba during summer months.

Baseng – the up and dry land is not as productive as the Saroba. Majority (91%) of the study households possess pieces of Basengs in an average of 1 acre per household, which, they utilize for mixed cropping like they do in their swiddens (Bagado).

Settled agricultural practices of the Lanjia Saora mainly revolve around their Saroba,

A comparison of agricultural yield between the past (10 years ago) and the present shows that, average production per acre for all kinds of crops from Saroba and Baseng have declined by – 12 percent during this time. The rate of decline for the paddy crop of the Saroba is –11.43 percent. For cereals, pulses and oilseeds grown in Baseng it is -13.21 percent, -15.29 percent and –20 (the highest among all) percent respectively. Thus yield from the Baseng, have declined more than that of Saroba.

People's Response on the Situation

The Lanjia Saora farmers generally know the reasons for decrease of their farm output. They mainly attribute the consequences to (i) Deterioration in the Quality of Soil, (ii) Uncertain Agro-Climatic Conditions manifested in erratic and inadequate rainfall

Now agricultural yields do not sustain many of them for a full year. Therefore they have to take recourse to seasonal migratory labour.

One third of them know that destruction of natural vegetations and population rise lie /at root of the present problems. Deterioration of the natural environment over period of time has become a matter of major concern for them. They apprehend that the situation is going to deteriorate further in the days to come

Horticulture

Being trees lovers, the Lanjia Saora they take all care to preserve the fruit plants like date palm, mango, jackfruit, tamarind, Mohul, Salap, Ramphal, Sitaphal etc

in their villages, hills and swiddens. Besides, they raise kitchen garden in their backyards and orchards.

Presently, following the diminishing returns from agriculture, shifting cultivation and forestry they are seeking for a dependable supplementary source in horticulture. They have started growing new horticultural crops introduced by themselves as well as the development agencies. Like the terrace cultivation, the horticulture programme, introduced as an alternative to swidden cultivation, has become popular.

Now besides the development of kitchen gardens and backyard plantations, mixed orchards and commercial cash crops, cashew have been raised in wastelands and hill slopes covering parts of degraded swiddens. The cashew plantation drive has been very popular for its low maintenance and high profitability. Now, they are growing cashew on their own initiative and so, more than 80 percent of the families own cashew orchards from which comes a good part of their income. Helping them to enhance their level of income, it has emerged as a gainful pursuit, gradually pushing shifting cultivation to the back stage.

Among the 100 study households 96 have kitchen gardens, backyard plantations (Kandung Sing) at an average of 0.10 Acs per household and 83 have orchards (Kota), mostly including the cashew plantations at an average of 1.79 Acs per household.

The deleterious impact of deforestation has also affected horticultural production in their backyards and kitchen gardens where they mostly raise conventional crops. The rate of decline over last 10-15 years has been - 20.5% in terms of quantity; but the deficit is made up in value terms by newly introduced crops like cashew, zinger, pineapple, coconut, tomato, cauliflower, beans etc which fetch them a better price.

The new crops and especially the cashew have reversed the trend of negative growth rate in all other sectors of production and registered a notable rise of +14 percent in case of the Orchards and +5 percent in total horticultural production nullifying the -20.5% decline in the yields of backyards and kitchen gardens between past and present.

Formerly, they were producing horticultural crops to meet their own consumption needs. After being aware of the better sale value of their fruits and vegetables, now they are raising modern HYV crops and selling these in the local

weekly markets to buy their provisions with the sale proceeds. This trend has begun since 10-15 years.

The respondents said that the area under horticultural plantations has expanded in the mean time and more particularly for the popular acceptance of the cashew plantation.

Shifting Cultivation

Shifting cultivation is an archaic agricultural system in which forests are cleared by felling and subsequent burning and are cropped discontinuously by (i) rotation of plots (ii) employing family and cooperative labour as chief input, (iii) application of crude technology using simple implements such as hoe, digging stick, knife, axe, sickle etc, and not using draught animals and (v) leaving a fallow period larger than the period of cropping.

Mostly the forest-dwelling tribals, resort to this archaic mode of cultivation, where enough plain lands are not available for settled cultivation. The most remarkable feature of shifting cultivation is that though the yield is low, a variety of cereals, pulses, millets, oil seeds and vegetables are grown in one plot which is not feasible in the plain land cultivation. The existence of this primitive agriculture as a way of life since the hoary past is a proof of its deep impact on the tribals' psyche. It has undoubtedly evolved as a reflex to the physiographical character of their habitat on specific adaptation to forest and hilly environments.

So long as the land man ratio remained favourable, this practice did not pose so much of a problem. However, the growth of population and depletion of forests have disturbed the equilibrium. The reduction of fallow has led to soil erosion and deterioration and permanent damage to land, which again led to extension of its coverage to larger tracts of forestland. Studies made by T.H.R.T.I, show that this practice is uneconomic for high requirement of seed and labour and low returns.

Traditionally for the Lanjia Saora, swidden cultivation (Bagad Chas) has been their way of life. With the depletion of forest growth and the underwoods, swidden cultivation does not pay dividends. Now the Saora have learnt in a hard way that this age-old mode of subsistence would no longer sustain their growing population. While they are trying to reduce their dependence on this less productive enterprise and looking for alternatives, they are yet to abandon the practice altogether.

Normally a *bagado* plot is cultivated for three consecutive years and left fallow for 8-12 years for rejuvenation for sustaining the next cycle of cultivation. The more the regenerative fallow period, the better is the fertility and productivity. Now these conditions are deteriorating day by day as stated earlier.

- There is gradual reduction in the cultivated area and the number of farmers from the 1st year *(amengal)* to the 2nd and 3rd year *(asinal)* of *bagado chas.*
- Over a period of 10-15 years, the over all quantum of production has decreased by 31 percent, the rate of decline being the maximum (-32.15 %) in the 1st year followed by those in the 3rd year (-29.89 %)and then in the 2nd year (-26.42 %).
- Among different categories of crops the rate of decline of yield is the highest (-42.86 %) for spices like Turmeric, Ginger, Chilies etc. followed by pulses (-35.90 %), oilseeds (-33.33 %), cereals (-30.71 %) and the lowest being the vegetables (-21.05 %).
- Spices, cereals and pulses are the worst affected crops during all the three-year cycle.
- For spices, pulses, and vegetables the highest decline is seen in the 3rd year *bagado.*
- For declining fertility of *bagado,* cultivation of a variety of crops have been stopped.

Peoples' Response on Causative Factors

The largest number of *bagado* cultivators (62%) knows that the yield is reducing with the decline of soil fertility. 50 percent of them attribute this to uncertain agro-climate with inadequate and irregular rainfall; 48 %, to soil erosion and 42%, to shorter fallow period.

The fallow period varies with the subsistence need of the farmer as it determines the extent of his dependency on *bagado chas,* be it profitable or not. A poor farmer with limited means of livelihood has no choice other than exploiting whatever *bagado* he possesses more frequently than a well-to-do farmer. In the past the fallow period for poor Saora farmers were 5-8 years and for the well to do it was 7-12 years as the land man ratio was better for smaller population. The situation has changed over period of time. The fallow period has been coming down to 3-5 years and 5-8 years for both the categories of farmers.

Many hill slopes are now degraded for continuous exploitation and become unfit for *bagado chas*. These are coming under the popular progamme of cashew plantation. The people are aware of the fact that the deteriorating ecological conditions would hardy sustain their traditional *bagado chas* but the poorer among them have little choice.

Firewood Collection

The Lanjia Saora generally collect firewood from their *bagado* and surroundings for their own consumption. In the past when vegetations existed almost in their backyards they moved within a radius of one kilometer to gather fuel for their kitchen. As the vegetations are vanishing, this distance has increased to more than 2 kms for the people of the study villages. Obviously this distance increases further in the summer months.

- Both the sexes shoulder the burden of firewood collection almost equally with small seasonal variations.
- For processing the firewood i.e., chopping, splitting and slicing the stock in order to make it ready for use, men are more engaged than women in all seasons.
- With depletion of the sources, the average quantity of annual domestic collections and consumption has come down by -24 percent and -17.13 percent respectively and the shortage is substituted by farm refuses e.g., crop residues, dry leaves etc.
- Though the demand-supply gap it has not yet turned so acute, the people understand that with the receding tree line and increasing population, the firewood is going to be scarce in future. Their womenfolk who have to keep their hearths burning are more alarmed than their men about the impending crisis.

Collection of MFP

The consumption pattern of tribals, indicate that the MFP items constitute important source of sustenance. The MFP provide raw material for their cottage industries. During drought and adverse climatic condition, tribals' dependence on MFP increases. In the area where job opportunities are few and viable economic alternatives are all but non-existent, this dependence is significant. Their subsidiary occupation involves total dependence on MFP for survival for at least three lean months in a year.

As forest dwellers the Lanjia Saoras derive a part of their subsistence out of forest based activities. They collect an endless variety of seasonal minor forest produce like small timber, bamboo, thatching grass, fodder, fruits, roots, seeds, tubers, mushrooms, leaves, flowers, fibers, leaves, barks, herbs, etc mostly, to meet their consumption needs. Only a few surplus items of fruits, flowers (Mohul), seeds and broomsticks are sold out after meeting their domestic requirements

All of them depend on MFP for their food, fodder, wild medicinal herbs, house building materials, and other needs. With depletion of forests these items are in short supply.

Collection and processing of MFP keeps them engaged for almost two and half months in a year. Sex wise the women are little more engaged i.e., average 73 man-days in a year than men whose average engagement in this trade is 69 man-days.

Deforestation is directly linked with reduced availability of MFP, additional workload and greater hardship, as the forest dwellers require more human power to collect even the minimum required for survival.

The distance to the source i.e., the forest has increased in the mean time for all items. That brings about the hardship to cover larger distance and spend more time in this activity.

The Lanjia Saora women shoulder the burden of collecting the MFPs more than men. Therefore they face the hardships more due to deforestation. They have to walk and work for an additional 3 to 4 hours a day to collect MFP and also work at home in order to survive.

The reduction in the supply of MFP between past and present is visible in all categories. The highest decline is in gums (-50 %), followed by broomsticks (-42 %), seeds, fruits and leaves (-39 % in each case), and the lowest, being in flowers (- 12 %). For other categories the rate of decline ranges between 16—36 percent. As a result their average household consumption of all these items have come down by 9—50 percent and created deficits by imbalancing the equation of demand and supply.

Most of the respondents kept repeating that the problem itself is the result of deforestation and the consequent lack of access to MFP. The first indication is the difference between the past and the present in the collection, consumption and sale of MFP. This is attributable primarily, if not exclusively, to the difference in the forest area available and the consequent difference in access.

Possession of Livestock

The Lanjia Saora rear animals for their agricultural, ritual and consumption purposes. With depletion of natural vegetations and decline in agricultural production, they now face problems to feed and maintain their livestock.

- The animal population has decreased significantly (- 40.14 %) with the average livestock per household shrinking from 14 to 8 animals over last 10 –15 years.
- The highest negative growth rate (-78.13 %) is recorded in case of pigs followed by buffaloes (-47.83 %) and cows (-45.51 %), the lowest (-23.64 %) being the bullocks.
- The largest number (71.35 %) of respondents cited about shrinking of grazing sources along with drying up of water sources and shortage of fodder caused by deforestation. Particularly, these factors have affected the populations of buffaloes, cows and goats.
- Pig rearing that has been quite common in the past has suffered a major set back on the advent of Christianity. Christianized Saoras are tabooed against this practice.
- Some village councils have restricted goat rearing in order to protect the horticultural plantations, which have started in a big way over past decades.

Indebtedness & Bondage

The deficit in the household budget caused by decline of traditional forest based subsistence activities on account of deforestation drives the gullible tribals into the vicious circle of indebtedness and bondage from which he cannot get out very easily. He and his children live in debt and die in debt. Indebtedness in most cases leads to bondage and land alienation. The worst victims are the poorer and landless sections who have no other options.

This situation was prevailing in the study area till the recent past. But now, thanks to the tribal and rural development programmes, the circumstances have changed. Nationalised Banks and Self Help Groups (SHGs) have come to their rescue overshadowing the unscrupulous private moneylenders and eliminating the chains of bondage out of indebtedness. The level of awareness of the people has also increased.

Now, Indian Bank, State Bank of India and SHGs have advanced substantially larger amounts of loans to the people than the private moneylenders. The position of repayment of loans by the loanees is also good i.e., 58.42 percent. This has curtailed the jurisdiction of the former over the needy people. As a result there is not a single case of bondage and alienation of any valuable economic asset to the private financiers on account of indebtedness.

Household Income

Between past and present, the average annual income of study households rose by 45.78 %, while the expenditure increased by 47.55% inflating the deficit in household budget.

The highest component of income i.e., (29.84 % in the past and 28.89 % in the present) comes from settled agriculture. Yet there is one percent fall between then and now for decline of productivity.

The second highest income is reported from horticulture. While the income from the backyards & kitchen garden sub-sector has decreased marginally from 6.05 percent to 5.48 percent, that from other horticultural plantations including mixed orchards and cashew plantations etc. have increased significantly from 13.02 to 17. 74 percent. Thus, the total contribution of horticulture sector to household income has risen from 19.07 to 23.22 percent negating the trend of decline in other sectors. This is happening for the popularity of modern horticultural programmes in general and the spread of cashew plantations in particular.

Forest collections that constituted the third largest source of household income (14.82%) in the past have fallen down to the 5th position (10.93 %) at present for gradual depletion of this age-old perennial source over period of time. It has come below that of wage and labour (15.16 %) and service (12.40%), which were in the 5th and 6th position in the past. That means following the decline of forest resources, people are looking for alternatives in other avenues like wage earning to supplement their income and make up the deficit.

Like forest collections another important age-old forest based source of subsistence i.e., the shifting cultivation has been declining. Its contribution to household income has come down from 11.46% to 6.19% over the decade downgrading its rank from 4th to 6th.

Moreover deforestation and the ban on hunting have affected the incomes from allied sectors like animal husbandry, hunting and rural industry that is largely dependent on forestry. While animal husbandry has gone down from the 7th to 8th position- the rate of decline being about 50 percent and the hunting, from 9th to 11th position, rural industry has improved its rank from the 11th to 10th, but its share has gone down from 0.12 to 0.10 percent. In case of hunting, the income has reduced by almost 80 percent making it a mere ritual activity.

Fishing has never been a significant economic activity for the Lanjia Saora and its contribution to household income is negligible. As such it holds the lowest rank in the past and the present. This too has declined by more than 50 percent in the mean time.

Thus it is found that the earnings from large number of sectors i.e., 7 out of total 12, has declined over the decade. Sectors like shifting cultivation, animal husbandry, forest collections, hunting and fishing have shown major decline and the remaining 2 i.e., agriculture and rural industry have shown marginal decline. Conversely, there is significant growth of income from sectors like horticulture, wage earning and service.

Household Expenditure

The quantum of average annual expenditure of the study households has increased on all the 18 heads.

Among all the heads the highest average household expenditure has been made on fooding and the second highest on, house construction and maintenance. Both have maintained their 1st and 2nd positions in the past and the present. A decade ago the total share of both the heads was (30.43% + 23.84% =) 54.27 percent of the total average household expenditure. Now this has marginally increased to 57.53 percent.

The expenditure on payment of land revenue has been the lowest among all the heads. Consistently, it has held the lowest i.e., the 18th rank then and now.

Expenses on agriculture, shifting cultivation and horticulture has come down in percentage terms i.e., from 7.1 %, 7.25 % and 7.25 % in the past to 5.69 %, 5.32 % and 4.12 % respectively in the present. While agriculture and horticulture have retained their 4th and 7th ranks respectively, shifting cultivation had stepped down from its former 3rd rank to 5th rank indicating its decline from the position of a major traditional subsistence activity.

The other heads, which have held their ranks consistently, are dress & ornaments (6th), rituals & festivals (8th), education (10th), treatment of diseases (12th) and rural industry (17th). However in percentage terms, their share has changed nominally both on the positive and negative side except that of rural industry, which has remained constant at 0.19 percent.

Presently, the people are not only spending more on construction and improvement of their houses, they have also raised their expenditure for acquiring modern and durable assets. This has caused the upgradation of rank of the head for purchase of durable assets from 11th to 9th while its share has increased significantly from 1.95 percent to 3.17 percent.

The data establishes a trend: the pattern of household expenditure of the Lanjia Saora has not changed much over the past decade. Yet signs of modernization are visible in increased spending on house construction and maintenance, acquisition of durable household assets, treatment of diseases, gift and exchange, education and training and fooding.

To sum up, the situation of deforestation for the tribe under study looks bad but not worse as it has been in certain other pockets. Yet it raises concern because in course of time, consequent upon deforestation, they are gradually getting marginalized and alienated and so, there has been a change in the economy of the tribe and in their attitude towards forest. There has been very little effort to orient the development programmes and forest management in harmony with their needs, problems and livelihood issues.

However, there are rays of hope. Being the industrious, innovative and

enterprising folks, the Lanjia Saora are trying hard to find alternatives in terrace cultivation, horticulture, seasonal migratory labour, by acquiring new ideas and modern skills while reducing their traditional dependence on forest based subsistence activities like shifting cultivation and forestry. Experiencing the environmental hazards of deforestation on their livelihood and culture, they have realized the indispensability of restoration of the degraded natural environment around their habitat for which they are willing to contribute their part actively by planting commercial as well as traditional species in their surroundings and degraded swiddens. They need to be encouraged and assisted.

Lunjia Saora Women Fetching Water for House

Shamanic Diagnosis for a sick Lunjia Saora Child

Terraced Paddy Fields of Lanjia Saora


GRACE & PRIDE

Lanjia Saora Old Lady smoking handmade cigarettee

PART – 2

THE JUANG

THE STUDY AREA AND THE ABORIGINES

The Juang tribe is found nowhere except in the state of Odisha. They are largely concentrated in the district of Keonjhar followed by the adjoining undivided district of Dhenkanal. In fact, their habitat is a continuous belt extending from the hills in the west of Keonjhar to the hill ranges of Pallahara of undivided Dhenkanal and its adjoining plains.

Location & Physiography

Keonjhar district is located in the northern part of the State between 21.1'N and 22.10'N latitude and 85. 11'E and 86. 22'E longitude with an area of 8330.7 Sq.Kms. The district is divided into two divisions, the upper Keonjhar consisting of the hill ranges of Gonasika, Mankadanacha, Gandhamardan and the lower Keonjhar, which is a plain area. The hills of Gonasika are the abode of the Juang. The rocky and forested surroundings guarantee the tribe an isolation in which they lead their life in their own style.

The undivided district of Dhenkanal lies between 20. 41'N latitude and 84.16'E longitude with an area of 1082.70 sq. kms. Here the Juangs are spread over the valleys of Pallahara and the plains of Kamakhyanagar and Sadar Sub-divisions.

The area covering both districts has a large number of hills and valleys intercepted by a network of perennial streams and rivers like Boitarani and Brahmani. The soil varies from rich loam to gravelly detritus of the hill slopes except plains that are fertile.

The Juang Country

The Juang claim Keonjhar as their homeland. Their stronghold area in Keonjhar district is called *Juang pirha*. It is a contiguous triangular piece of country divided into four traditional maximal territorial units like Jharkhand *pirha*, Sathkhand *pirha*, Rebena *pirha* and Kathua *pirha* with a roughly north to south alignment along a range of hills with Keonjhar at it's apex and Kuanr and Basantapur at it's base. In the center of the Juang country lies Gonasika, the holy birth place of the Juang tribe and is surrounded by other Juang villages. From this place the holy river Boitarani originates and traverses through the whole district.

The Study Area of *Juang pirha* of Keonjhar district is a rugged, mountainous highland country predominantly inhabited by the Particularly Vulnerable Tribal Group(PTG) ie, the Juang. This picturesque territory with its undulating terrain, rolling hills, perennial hill streams and patches of lush green forests lies at an average elevation of 2000'-3000' above the sea level. This lovely highland country is dotted with hundreds of Juang villages of which 35 have been covered by the PTG Development Micro Project named **Juang Development Agency (JDA)** headquartered at Gonasika. It is situated at a distance of 35 kilometers from the district headquarters i.e., the Keonjhar town and approachable by all-weather *pucca* road.

The present study has covered 10 Juang villages of JDA spread over 5 Gram Panchayats (GPs) namely, Tala Champei, Gonasika, Kodipasa, Baragada and Kuanr under Bansapal Block of Keonjhar Sadar Subdivision and ITDA.

Flora

For abundant rainfall and varation in altitude in this region, the forests here support varieties of vegetations. The important species are *Sal (Shorea robusta), Amba (Mangifera Indica),* Panasa *(Artucarpus heperphyllus), Kendu (Diospyros melanoxylon), Gambhari (Gomelina arborea), Kusum (Schleichera trijuga), Karanja (Pongmia Globra), Jamun (Eugenia Jambolana), Mahua (Bassia latifolia).* Clumps of bamboo *(Bambusa stricta)* grow in abundance in this area particularly in Pallahara area. A kind of tall grass known as *Sinkunda* grows around the villages and is used as thatching grass. *Siali* creeper whose stem is used for rope making and leaves for cups and plates is also abundant.

The contribution of forest to the economic life of the Juang is very significant. In the past, the area was under thick forest cover. But now only patches of vegetations are left. The practice of shifting cultivation and destruction of forests has made the wild animals scarce in the area.

Fauna

In the yester years it was a wild country rich in its natural wealth of flora and fauna. Tigers, panthers, leopards, bears, wild dogs, jackals, elephants, porcupines, fowls, Sambars, deers, wild pigs, wild goats, monkeys, peacocks, pythons, cobras were roaming in its wilderness. Now the fauna is almost depleted with the forest. However, elephants, leopards, hyenas, bears, deers of various kinds, wild boars, Sambar, monkeys, cobras,

and python are still found in the forests in small numbers. The wild birds include peacocks, wild fowls and pigeons. Tigers are rarely found now, although occasionally one hears of a stray panther or a leopard, their number and appearance by no means of any consequence. Herds of elephants still cause some damage to the crops and march into the human habitations in search of food.

Climate

The area experiences a mild and moderate climate, with a short and mild summer, moderate monsoon and a long winter. The summer season in this area commences by the beginning of March when temperature begins to rise rapidly. May and June are the hottest months when the temperature rises to 40°c. But in higher ridges the climate is cool and enjoyable. With the onset of monsoon, the climate becomes cool and pleasant. In October, temperature decreases further. The winter lasts from December to February. The monsoon breaks in the month of June and continues till the middle of October. During this period rains are continuous and heavy and nearly 80 per cent of the annual rainfall is received during these months. The annual average rainfall of the project area is about 1400 mm to 1550 mm.

The Juang; *A Socio-Cultural Profile*

The Juang, one of the Primitive Tribes (PTG) of Odisha, are found in the districts of Keonjhar and Angul. According to Verrier Elwin, a noted ethnographer, the meaning of the term 'Juang' is 'Man'. They claim themselves to be the first humans on the earth, originating at the sacred Gonasika hills as descendants of their legendary ancestors, the *Rusi* couple. The district of Keonjhar in general and Gonasika in particular is said to be their original homeland. The place of their mythical origin is Gonasika, which is also the place of birth of the sacred river Boitarani. In the past, they were being called *Pattooas* for wearing leaves. It is unique that this tribe is found nowhere else in India, except in Odisha State.

The Juang classify themselves into two sections i.e. the *Thaniya* (natives) and the *Bhagudia* (escapists); the former climing superiority over the latter. The *Thaniyas*, live in their own homeland called Juang *Pirha* located in and around Gonasika hills, while the *Bhagudias* are those who have fled away from their homeland to the Pallahara area of neighbouring district. The migration had largely taken place in the past during the Bhuiyan rebellion in 1861.

Linguistically, Juangs are Munda speaking people (Munda being one of the Austro-Asiatic language families) and racially they belong to Proto-Australoid stock. Now a days, as a result of contact with Oriya speaking people, they can speak Oriya. As per 1991 census their total population was 35 665, sex ratio was 1059 and their level of literacy was 14.46 percent. By 2001, their total population has increased to 41339 including 20524 males and 20815 females registering a growth rate of 15.91 percent. Their literacy level has improved to 25.35 percent.

The Juang inhabit a block of hills and forest clad country in south and west of Keonjhar; the hills end in plains of Pallahara to the east and the plains villages of Angul along the southern border. In Keonjhar the Juang are found in four *Pirha* areas (maximal traditional territorial organization) namely, Jharkhand, Sathkhond, Rebena and Kathua.

The Juang of Satkhand and Jharkhand *Pirhas* consider themselves superior to the Juang of the other two *Pirhas*. They state several reasons to account for their superiority. The important reasons are that they live in and around their place of origin i.e. the sacred hill of Gonasika and have retained the originality of their culture whereas the inhabitants of Kathua and Rebena *Pirhas* who are plain dwellers have diluted their originality as they live in close proximity of caste Hindus and other tribal communities.

The Juang live both in small and big villages. The typical Juang settlements in Gonasika region are scattered, hidden inside hills and forests Some settlements are found in the plains. A unique feature of the Juang settlement pattern is their periodic change of village site in tune with the cyclic rotation of their swidden sites. Each village has a number of habitations sites and the villagers live in one site for a number of years after which they move to another site. Several reasons are attributed to the change of village site, the main reason being the shortage of *toila* (swidden) land around the site, outbreak of epidemic, attack of wild animals and occurrence of frequent death in the village, etc. Now-a-days they live in permanent villages and in the colonies made under the Indira Awas Yojana.

In each and every Juang village, there is the institution of a community center called *majang* or *mandaghar*. It is a rectangular house standing conspicuously in the center of the village serving as a dormitory house for the youth, court house for the elders and *barabhai*, guest house for visitors, cooperative store for storage of common grains, place for keeping musical instruments, a venue for communal rituals,

cultural center for dance and music and a museum of Juang art and craft. The *majang* plays a central role in the socio-political and economic life of the Juang.

Another important feature of the Juang society is their traditional youth organization and dormitory associated with the *majang* or *mandaghar*. The unmarried boys and girls become members of this institution. They are a well-organized group that carries out various public services and social and cultural activities for their community. Boys and girls together sing, dance and make merry in moonlit nights in front of *majang*. The educative role of the *majang* is very vital. Here the younger boys and girls learn from their elders the traditional customs and manners and values and norms of their society. The main objective of the youth organization is to perpetuate the tribal solidarity and promote their culture.

The typical Juang villages are compact settlements with the *majang* at the center and the houses of the individual families scattered here and there encircling it. There is no regular street passing through the houses. In front of the *majang*, there is spacious ground where the boys and girls dance with their *changus* (tambourine) and communal festivals, feasts and meetings are held.

The Juang houses are small in size barely having enough space to accommodate a couple and one or two unmarried children. The walls are made of wooden pillars plastered with mud and cow dung. The roof is thatched with wild grass. The cattle are kept in a separate shed built close to the main house. Guests and relatives are accommodated in the *majang*.

The Hill-Juang eke out subsistence pursuing shifting cultivation and collecting minor forest produce. The plains-Juang earn their livelihood by pursuing small-scale settled cultivation and wage earning.

Rice is their staple food. The plains Juang who cultivate lowland paddy fields produce more paddy for household consumption than the hill Juangs who has the least chance of getting a bumper paddy harvest from their rocky *toila* fields because, paddy cultivation on the hills always depends on the rains and is exposed to the ravages of wild animals. However, the latter produce varieties of crops like beans, pulses and millets in their swiddens, which are consumed in lieu of rice. Fruits, roots and tubers collected from the jungle, also supplement their diet. The cash crops, such as *rasi* and mustard are exchanged for paddy and *ragi*, which are eaten during the lean season. In summer jackfruits and mango begin to ripe and these are consumed in plenty for a month or two as a substitute for rice. Rainy season is the busiest

season of the year for the agricultural operations and in these months the Juang like to eat well. Surplus rice is stored for rainy season. Hunting and fishing are pastimes rather than economic pursuits for them. The Juang get meat by occasional hunting. Ceremonial hunting is done during *Am-Nua* (new mango eating) and *Pus Puni* festivals. With gradual depletion of forest the sustenance derived from the forest by means of hunting and collection of minor forest produce is declining over period of time.

There is no peculiarity in the dress pattern of the Juang. The men wear *dhoti* and women put on white or coloured saree. The school going children wear shirts while other children wear napkins. The Juang put on the same type of dress all the year round. The Juang women take pleasure in adorning their bodies with various kinds of ornaments such as, bangles, anklets, armlets, earrings, nose and toe rings, waist chain made of brass or aluminum and different varieties of bead and coin necklaces bought readymade from the market. Tattooing is preferred by Juang women to enhance their beauty.

Family is the basic social institution of the Juang society. It is patrilineal, patrilocal and patriarchal. It is the primary unit of production, distribution and consumption. Basically the Juang have nuclear families consisting of husband, wife and unmarried children. After marriage the grown up sons build their separate houses. Transitional extended families having married couple and old parents are also found.

The most remarkable event in the life of the Juang is marriage. There are certain rules and regulations for arranging the matrimony. Firstly, marriage within the same clan *(kili)* is not allowed since clan members are treated as brothers and sisters. Secondly, not only each clan is exogamous, but also each has a number of associated *kutumb* or brother clans among which marriage is not permissible. Thirdly, marriage in either higher or lower generation is considered improper though not strictly prohibited. The fourth factor for finalizing a marriage is to forecast it's future sanctity and success by reading omens. More over payment of bride price is customary in all regular types of marriages. The Juang practices the following forms of marriage.

1. Marriage by arrangement, 2. Marriages by capture, 3. Love marriage, 4. Widow remarriage, 5. Marriage by elopement.

Other distinguishing feature of the Juang is their strong kinship organization dividing them into *kutum* (kins), and *bandhu* (affines). As most of the Juang villages have uni-clan composition, village exogamy is the rule.

The Hill-Juang villages of Gonasika area are grouped under four *pirhas* - territorially organized confederation of villages, which had received due recognition and patronage of the rulers of ex-Keonjhar State. A traditional tribal chief designated as Sardar leads each *pirha*. Each Juang village is an autonomous socio-political unit managed by a set of traditional leaders and a corporate body of village elders called *bhalabhai* or *barabhai*. The village community owns and manages all the productive and useful natural resources like swiddens, forests, grazing land, and habitation sites etc., which lie within their village boundary.

The Juang observe various festivals and rituals throughout the year to worship their deities and ancestors. Their important festivals are *Pus Puni, Am Nua Tirtia, Asadi, Pirha Puja Dhan-Nua* etc. Among these, *Pus Puni*, marking the beginning of the agricultural cycle, is most auspicious and important and they observe it for three days with pomp and ceremony. Dance and music form an integral part of Juang's celebrations. Besides, the boys or girls of one village visit another village on dancing expeditions. Their characteristic *changu* dance continues for two or three days without break. The Juang are fond of dance and music. They have several folk songs, legends and folk tales, which depict their origin, cultural values, day-to-day activities, love and sorrow. The Juang believe that their life is controlled and guided by various deities and deified spirits who live around them in hills, forests, rivers and sky.

The Juangs are socio-economically backward. The Juang *pirha* area of Keonjhar comes under the jurisdiction of Keonjhar I.T.D.A. for the purpose of execution of various development programmers. Besides, one Micro Project named the Juang Development Agency having its headquarters at Gonasika, has been functioning with the sole objective of bringing down all-round socio-economic development of the Juang. The Micro Project has been implementing various income generating and infrastructure development schemes for the tribe giving major thrust on promotion of modern agricultural practices and education, prevention of *podu* cultivation an extension of health care services.

EFFECTS OF DEFORESTATION: ENVIRONMENTAL

The forests as whole function as the biomass system that keeps the ecological equilibrium needed for the rain and for the water and soil preservation and soil fertility maintenance cycle, essential for the people's survival, especially of the forest dwellers. This balance disappears with deforestation because forests have come to be regarded as a non-renewable resource rather than a life support system meant to cater to the needs of the people in these days.

Ecologically, forests influence natural phenomena like rainfall, atmospheric quality, floods, landslides and other natural disasters. An immediate consequence of deforestation is environmental deterioration. Today the disastrous consequences of deforestation manifests in shapes of soil erosion due to inadequate tree cover, drought due to loss of ground water storage, floods due to run off water, and landslides due to the denudation of hills. Scientifically, it is an established fact that in maintaining the ecological balance the functions of forests are very significant.

In Odisha, as in most other states, tree cover is closely connected to the extent of exploitation of forest resources and the nature of people's dependence on forests. In other words, it is a case of over-exploitation of forests by various agencies.

Today the Juang of the study area, Gonasika, have come to realize the fact that the destruction of nature leads to the deterioration of human beings, especially those belonging to the weaker sections like themselves who has been depending on nature for their very survival since time immemorial more than the others. Consequently, any deterioration of the environment hits them harder than any one else.

In order to understand their perception of the present situation of deforestation and its deleterious impact on the natural environment in their habitat, 21 key informants belonging to 4 study villages were made to speak through open-ended interviews and focused group discussions in course of the study. The deliberations covered questions like changes occurred in forest area coverage, forest density and the location of villages with reference to forest: how deforestation has affected the environment, how the impact of deforestation is seen in shape of

deterioration of the soil and if those are responsible for i) decrease in yield from agriculture, horticulture and shifting cultivation, ii) drying of water sources iii) erratic and reduced rainfall, iv) unpredictable climatic conditions, v) rise in atmospheric temperature and vi) draught.

In regard of the change in the area under forest coverage and forest density most of them i.e., 18 out of 21 (85%) agreed that forest coverage has reduced very highly by 60-70 percent and the forest density has also decreased highly by about 50 percent.

Three to four decades ago the study villages like Guptaganga, Gonasika, Kadlibadi, Tangarpada, Tala Baruda, Jantari and Tala Panasnasa were close to forests i.e., vegetations existing within a walking distance of 1-2 kms from their villages. Now the receding forest lines have stretched the distance from 3 kms up to 7 kms. All the 21 key informants commonly hold this opinion regarding the location of the study villages with reference to forest.

Majority of them (81%) believed that deforestation has affected their natural environment more or less. The impact of deterioration of natural environment is visible in deterioration of the soil through the ongoing process of soil erosion, loss of soil nutrients, fertility and moisture. They know that the trees extending roots into the earth hold the soil from being washed away by flowing water and help in maintaining the soil moisture.

All the key informants agree that deforestation is responsible for the deterioration both in the quantum and the quality of soil. Denudation of forests, over grazing and other destructive measures result in soil erosion. They claim that soil fertility has declined, considerably over last three decades.

Many of them are aware of the major problem that arises from soil erosion is the rise in the riverbeds because of siltation that causes over flooding.

They believe that drought is the consequence of reduction of moisture in soil due to the felling of evergreen trees with large leaves that protected land from the summer sun. With the over exploitation of forests and clear felling of the trees that provide the humus required for retaining the ground water level, the condition certainly gets worse. They understand that this has led to the lowering of the water table, reduction of moisture in the atmosphere and the consequent decrease in rain or to erratic rainfall. Also the people attribute to deforestation, the decrease in

yield from farmlands, swiddens and horticultural plantations, drying of water sources, uncertain climatic conditions, rise in atmospheric temperature, flood and draught that has become a regular feature during the last few decades. They have suffered from the hardship facing the consequences of drought such as scarcity of drinking water, scarcity of food for crop failure, and shortage of fodder etc.

The Juang have lived with the forest for centuries and built up a symbiotic relationship with the forest. Now many conscious Juangs have come to understand that this equation has been disturbed by deforestation. Destruction of forests is not merely disappearance of trees but of the resource on which the tribal economy, culture, social life and religion depend. As they have been depending on the forests for their very survival from time immemorial, wanton destruction of forests has not only disturbed the ecological balance but also put pressure on the diminishing forest resources. Consequently, the destruction of natural environment in their habitat does not merely deprive them of their very life support system but sets a new destructive process in motion that threatens their existence. Consequently they find it difficult to pursue their traditional occupations and sustain their livelihood as their perennial source of subsistence is disintegrating in these days.

EFFECTS OF DEFORESTATION: SOCIO-ECONOMIC

The denizens of forest satisfy their numerous needs from the forest with the help of most simple implements and without any external technological aid. They depend on the forest flora and fauna for their livelihood and collect various kinds of Minor Forest Produce (MFP) in different seasons. So, in the tribal economy forests occupy a central position.

Traditionally the tribal people thrived on a subsistence economy derived out of hunting, food gathering and shifting cultivation. Being forest dwellers they have few viable economic alternatives and employment opportunities. Naturally, they have to depend on subsistence agriculture and on the forest. The extent of this dependence needs to be studied in order to understand its ramifications in the backdrop of deforestation.

In Odisha the standard of living of tribal people is low. What is of primary relevance to our study, however, is the socio-economic condition of the tribals like the Juang as affected by the consequences of deforestation given the facts that a vast majority of them who are predominantly forest dwellers are economically backward, pre-literate and underexposed to the outside world. They lived with the forest for centuries inhabiting clusters of villages mainly in the hilly areas, dependent primarily on shifting cultivation and minor forest produce (MFP) and thus built up a symbiotic link with forest in context of their social, cultural and occupational life. Forest has remained an important resource base for them. Therefore, depletion of forests has not only disturbed the ecological balance but also put pressure on the forest resources as well as the Juang as forest dwellers. Now they find it extremely difficult to sustain their livelihood and to pursue their traditional occupations because their perennial source of subsistence is dwindling over period of time.

The Juangs are a forest dwelling folk. Since the hoary past, their socio-cultural life developed amidst the forest environment. As such their life and culture is so inseparably linked with the forest that they cannot think of their survival without the forest. Like a loving mother, forest meets most of their needs. They regard the forest as a permanent gift of the mother's earth (whom they regard as one of their Supreme Deity and call Basukimata – the Earth Goddess), which they have inherited

from their forefathers. They worship a number of deities residing in the hills, forests, fields, rivers, streams namely Thanpati, Boitaranipat, Gutipat, Rangapat, Kalapat etc. in all major rituals they pay homage to these deities to seek their blessing and protection. Particularly in the *pirha puja* festival held in July-August, they pray the forest and hill deities. Their strong emotional attachment with the forest makes them quite possessive about it and they always treat it as their own property. However they understand quite well that forest resources are limited and they shall be the worst sufferer if forests are destroyed by greedy and irresponsibly human beings. They have developed their own cultural norms for the management and protection of their forest resources.

Although there are no strict restrictions for a Juang against exploiting forest resources anywhere within the Juang *pirha* area, the Juangs respect the territorial autonomy of neighboring villages and ordinarily collect their requirements from the forests lying within their respective village territories. Only they collect as much forest produces as required for their own consumption but not for hoarding, sale or profit. Overexploitation of forest resources by any person with selfish motives or for commercial interests is looked down upon as an antisocial act.

Activities like, climbing and cutting trees, hunting, catching birds and collecting honey are tabooed for Juang women. Felling fruit bearing trees and certain useful plants such as mango, jackfruit, *kendu, mohul, jamu, khajur,* etc. are tabooed for all. Certain plant and animal species, which are ritually connected to them either as totemic objects for different clans or otherwise are also left untouched. They spare these forbidden plants while felling trees in their *toila* sites. They believe that causing any harm to these forbidden plants, species offends the deities and ancestral spirits resulting in disaster and human suffering.

No one dares to eat the seasonal fruits collected from the forest before offering the same to the deities and ancestral spirits. They observe a number of communal rituals and festivals round the year like Amnua, (February-March), Asadi (June-July), Manchuri Puja (July-August), Kimiyang and Kalart Aba (September-October), Gundadia (October-November) for this purpose. In the Amnua (New mango eating) festival, they offer green mangos to the deities and ancestral spirits and thereafter they eat the new fruit. Similarly in Asadi Parab, they offer *bangur* fruits to the deities before eating the same.

In the good old days, when there were vast expanses of forests crowded with wild animals in the Juang country and the Juangs had full freedom of exploitation of

forest resources, regular hunting formed a part of their subsistence. Gradually the forests are depleted and the wild animals reduced considerably. In these days when hunting has been totally banned for conservation of the natural environment in general and protection of wild animals in particular, the hunting activities of the Juangs have become a pastime, perused very occasionally and with this their past skill in hunting has also diminished.

With the receding forest line, environmental problems arise and their struggle for survival becomes intense weakening their traditional economy and affecting their socio-economic existence. In this situation, it becomes imperative to understand the magnitude and direction of the impact of deforestation on their socio-economic living conditions especially with reference to their occupational position, social and cultural life, living standard and economy as a whole.

Study Villages

In the study area, the villages are predominantly inhabited by the Juang in which few other tribal and non-tribal communities are found. The 100 Juang households covered under the study belonged to 10 villages of which 9 are inside the JDA micro project area and the remaining one i.e., Kuanr is outside the micro project area. These villages come under 5 gram panchayats inside Banspal block. The details are given in the following statement.

Sl. No	Names of the Juang Study Villages	Names of the Gram Panchayats	Number of Study Households
	(Within JDA Area)		
1	Dumuria	Baraguda	3
2	Gonasika	Gonasika	12
3	Guptaganga	Gonasika	23
4	Jantari	Gonasika	11
5	Kadlibadi	Gonasika	5
6	Tala Baruda	Baraguda	9
7	Tala Champei	Tala Champei	6
8	Taja Panasanasa	Kuanr	8
9	Tangarpada	Kodipasa	19
	(Outside JDA Area)		
10	Kuanr	Kuanr	4
Total			**100**

Population, Marital Status & Literacy in Study Households

COMPONENTS	MALES	FEMALES	TOTAL	SEX RATIO (No of Females per 1000 Males)	AVERAGE HOUSEHOLD SIZE
	(Percentages in brackets)				
Population	280 (52.93)	249 (47.07)	529 (100)	889	5.3
Marital Status				Observations	
Married	112 (40.00)	114 (45.78)	226 (42.72)	More married women than men	
Unmarried	156 (55.71)	125 (50.20)	281 (53.12)	More unmarried men than women	
Divorcee	2 (0.71)	nil (0.00)	2 (0.38)	Very low incidence of divorce	
Separated	1 (0.36)	3 (1.20)	4 (0.75)	Very low incidence of separation involving more women	
Widow/Widower	9 (3.21)	7 (2.81)	16 (3.02)	More Widowers than Widows	
Total	560	498	1058		
Literacy					
Literates	126 (44.64)	57 (22.89)	183 (34.59)	Total Literacy & Female Literacy Low	
School Going Children	70	42	112		

THE ECONOMIC SYSTEM

The Juang economy is a typical subsistence economy founded on land and forest. Traditionally they were hunters, food gatherers and shifting cultivators. Over generations, they have been living in hills and forests deriving sustenance from the resource bases of the mountainous country in various ways to meet their small needs and making a bare minimum living. When the hills and valleys were covered with lush green vegetation, the Juang were exploiting the resources with mirth and furry. Toila cultivation was their way of life. Today, with the depletion of forest growth and the under-woods and growth of their population, swidden cultivation did not pay dividends, forest collections diminished, wild games disappeared and the Juang are struggling to make both the ends meet.

Skills & Occupational Pattern; Continuity & Mobility

In the study area, rapid depletion of forests has led to deterioration of natural environment. This has squeezed their traditional life support system i.e., their economic resource base. Their dependence on traditional sectors such as, hunting, shifting cultivation, animal husbandry and other forest based subsistence activities including collection of minor forest produce have declined slowly in course of time

following the trail of deforestation. Gradually, they have taken up pursuits like settled cultivation to grow paddy in valleys, horticultural plantations, collection and sale of firewood and wage labour in general. Some of them have acquired skills in weaving, rope making, mat making, comb making, masonry, carpentry, basketry and dancing which fetches them some supplementary income. The following Statements show the position in respect of the Study Households.

TOTAL POPULATION OF STUDY HOUSEHOLDS		SKILLS								
		TRADITIONAL						MODERN		
		Comb Making	Mat Making	Rope Making	Basketry	Wood Carving	Juang Dance	Mason	Carpentry	Weaving
Males	280	19	-	12	7	5	23	14	13	2
Females	249	-	11	-	10	-	14	-	-	11
Total	529	19	11	12	17	5	37	14	13	13

- There are still some Juang men who possess skills in their traditional crafts such as Comb Making, Rope Making, and Wood Carving. They exhibit fine workmanship in woodcarving and comb making. Mat Making is women's job. Both the sexes take up Bamboo Basketry and Dancing.
- The characteristic *changu* dance of the Juang with enchantic songs and music is a folk tradition that has survived the test of time. While men beat *changu*, women dance. In all festive occasions they rejoice by performing this dance and it continues non-stop for days and nights.
- Acquisition of modern skills like masonry, carpentry, weaving etc. is a recent phenomenon brought about by their mobility and exposure to the modern world when the decline of their traditional economic base effected by deforestation and environmental degradation pushed them to look for alternatives outside their natural habitat. It is interesting to note that except weaving, only men possess these new skills.

STUDY HOUSEHOLDS (Percentages in Brackets)			MAJOROCCUPATIONS(ENGAGEMENTS IN MANDAYS) (Per Capita Average in a Year given in Brackets)				
Break up	Total Population	Working Population (15-59 Yrs)	Settled Cultivation	Shifting Cultivation	Wage & Labour	Forest Collection	Total
Males	280 (100)	127 (45.36)	5 391 (43)	4 942 (39)	4 187 (33)	4 458 (35)	**18 978** (149)
Females	249 (100)	123 (49.40)	4 632 (38)	4 185 (34)	4 982 (41)	3 964 (32)	**17 763** (144)
Total	**529** (100)	**250** (47.26)	**10 023** (40)	**9 127** (37)	**9 169** (37)	**8 422** (34)	**36 741** (147)

- A little less than half of the studied population (47.26 %) belonging to the age group of 15—59 years comes under the category of Working Population.
- Corresponding to the sex ratio and marital status, in the Working Population numerically, men maintain superiority over women, but percentage wise, it is the *vice versa*.
- The average engagement of the Working Population in major economic pursuits like Terrace Cultivation, Shifting Cultivation, Wage earning and Forest Collection keeps them occupied for less than half of a year. It means they remain under-employed for the remaining part of the year.
- Sector wise men spend the largest number of days in average in Settled Cultivation followed by, Shifting Cultivation and Forest Collection and the minimum in Wage & Labour. For women it is Wage & Labour –the highest, followed by Settled Cultivation, Shifting Cultivation and the lowest in Forest Collection. Thus forest based subsistence activities, in combination of Shifting Cultivation and Forest Collection, still remains their major economic pursuit in terms of the extent of engagement for their age-old dependence on forest.
- In terms of average engagement in these avocations men work little more than women in all sectors but Wage & Labour.

Agriculture

Agriculture is the mainstay of the Juang economy. Shifting cultivation – the traditional mode of their subsistence no longer remained profitable under the cumulative impact of deforestation, ecological imbalance and decline of land / man ratio due to pressure of growing population. Cultivable plain/wet land is in short supply in their area for undulating nature of the hilly terrain and population growth. Wherever they have found such type of farmland for settled cultivation they have developed it as paddy fields. Yet, they still have to continue with shifting cultivation to supplement their earnings from settled cultivation, forest collection, wage earning, and other economic pursuits. Mainly they grow a variety of minor millets, cereals, and pulses in their swiddens and paddy in their plain lands.

The Juang possess four kinds of farmlands – (i) Beda / Bila: the plain paddy fields for wet land settled cultivation, (ii) Guda: the up and dry land (iii) Toila / Kaman for shifting cultivation and (iv) Badi / Bakdi: the backyard kitchen garden. The Guda and Toila / Kaman are utilised for growing a variety of cereals, pulses, oilseeds and vegetables.

Cultivable Land Holding Pattern

Total Study House holds	Land Less House holds	LANDOWNING HOUSEHOLDS classified into successive CATEGORIES OF FARMERS						
		Items	*Marginal Farmers* (> 1Ac)	*Small Farmers* (1.1-2.5Ac)	*Medium Farmers* (2.6-5Ac)	*Big Farmers* (5.1 >)	*Total*	*Observations*
100	5	No of Households	17 (17.89)	39 (41.05)	25 (26.32)	14 (14.74)	95 (100)	• Cultivable lands include all kinds of agricultural & Horticultural lands excluding the swiddens • 5 % of the Study Households are landless • Small Farmers form the majority group among all categories • Bulk of the landowning households fall under Marginal & Small Farmers category
		Total Area of Landholding (Beda, Guda & Badi) (in Acs)	10.76	57.32	73.11	85.65	226.84	
		Average Landholding per Household (in Acs)	0.63	1.47	2.92	6.12	2.39	

Trend of Agricultural Production

Settled agricultural practices of the Juang mainly revolve around their Beda or Bila, which they regard to be their valuable productive asset. The following statement reveals that 83 percent of the study households possess cultivable wetlands in shape of Beda at an average of 0.95 Acres per farmer household. But Juang farmers hardly raise a second paddy crop in *Beda* during summer months even though they get irrigation facilities. *Guda* – the up and dry land is not as productive as the Beda. However majority (95%) of the study households have pieces of *Gudas* in an average of 1.56 acres per household, which, as shown in the following statement, they utilize for mixed cropping like they do in their swiddens (*Toila*).

The comparative picture of agricultural production in the past and present given in the preceding statement shows that;-

- Decline of agricultural production is reported in respect of all categories of crops for both the categories of farmlands @ -20 percent over the decade.
- Production of paddy crop from the Beda in terms of total quantity has come down by -18.35 percent.
- In case of the annual yield from the *Guda*, the rate of decline is higher than Beda Among all the different categories of crops grown in *Guda* as well as the Beda the rate of fall is the highest (-29.49 %) for the oil seeds.

Category of Farmland	Number of Farmer House-holds (HH)	Total Area of Land holding Average Per HH (in Acs)	Cropping Pattern	Annual Yield (in Qtls)					
				PAST (About 10 Yrs Ago)			PRESENT		
				Total Yield (100)	Average		Total Yield (% Of Change)	Average	
					Per HH	Per Acre		Per HH (% of Change)	Per Acre (% of Change)
Beda / Bila (Plain Lands)	83	79.03 (0.95)	Paddy	1013.4	12.21	12.8	827.4 (-18.35)	9.97 (-18.34)	10.5 (-18.33)
Guda Up& Dry Land	95	147.81 (1.56)	Cereals, Gudadhan, Sutun, Gangei, Ruma, Maize, Ragi, Jana, Kangu, etc	379.28	3.99	2.56	296.56 (-21.81)	3.12 (-21.80)	2.01 (-21.48)
			Pulses Arhar, Kulthi, Biri, Kathia, Kalada etc.	117.6	1.23	0.79	89.21 (-24.16)	0.94 (-23.58)	0.60 (-23.60)
			Oil Seeds Mustard, Rasi, Castor etc.	39.27	0.41	0.27	27.69 (-29.49)	0.29 (-29.27)	0.19 (-29.63)
Total	95	226.84 (2.39)		1549.6	16.31	6.83	1240.84 (-19.92)	13.06 (-19.92)	5.47 (-19.91)

People's Response on the Situation

The following Statement shows that the Juang farmers generally aware of the reasons for decrease of their farm output. They mainly attribute the consequences to (i) Deterioration in the Soil Quality, (ii) Uncertain Agro-Climatic Conditions manifested in erratic and inadequate rainfall. Since most of their farmlands lack assured irrigation facilities, they are bound to be dependent on the natural agro-climate to reap a good harvest. Deterioration of the natural environment over period of time has become a matter of major concern for them.

Total Number of Respondent Farmers	Farmland Category	Stated Reasons for Decrease of Farmland Yields (No of Respondents)		
		Deterioration of Natural Environment		
		Deterioration of Soil Quality		Uncertain Agro-Climate
		Soil Fertility Declining	Erosion of Fertile Soil	Inadequate & Erratic Rainfall
95 (100)	Beda	49 (51.58)	27 (28.42)	19 (20.00)
	Guda	53 (55.79)	32 (33.68)	10 (10.53)
	Total	**95** (100)	**59** (62.11)	**29** (30.52)

All the Juang farmers (100%) agree on the point that their farm outputs from Beda and Guda lands are shrinking for Loss of Soil Fertility. The soil has not remained as fertile as it has been in the past. In addition to that nearly 60 percent and 30 percent of them have identified other important causative factors like Soil Erosion and Uncertain Agro-Climate such as Inadequate and Erratic Rainfall for the diminishing returns.

Further opinions emerged on the state of affairs in the group discussion

- In the past, when there were of lush green forests all around, the rainfall was abundant and the soil, fertile. Toila cultivation and forest collections provided enough food to feed lesser number of bellies. As these traditional sources started shrinking day-by-day, their dependency on settled cultivation and other sources has increased.
- As their population is increasing, cultivable land holdings are becoming smaller after family partitions.
- There is little scope for expansion of cultivable land area for the undulating terrain of their habitat.
- Now the reduced agricultural yields do not sustain many of them for a full year.
- One third of them know that deforestation and population growth lie at root of the present problems of survival.

Horticulture

The Juang take care to preserve the fruit plants like date palm, mango, jackfruit, *mohul, kendu* etc in their villages, hills and swiddens. They save the fruit bearing and other useful trees while they clear off all other vegetations in their Toila. Besides, they raise kitchen garden called Badi or Bakdi in their backyards or adjacent to their houses.

Presently, following the gradual decline in agricultural production and forest produce they are being motivated by the development agencies like the ITDA, DRDA and JDA to raise profitable horticultural crops to make up the deficit and supplement their income. Now some of them have started growing many new varieties of horticultural crops including vegetables as evident from the following Statement.

Category of Farmland	Number of Farmer House-Holds (HH)	Total Area of Land holding Average Per HH (in Acs)	Plants /Crops Raised		Annual Yield (in Qtls)					
					PAST (About 10 Yrs Ago)			PRESENT		
					Total Yield (100)	Average		Total Yield (% Of Change)	Average	
			Traditional	New		Per HH	Per Acre		Per HH (% of Change)	Per Acre (% of Change)
Badi / Bakdi Backyard & Kitchen Garden	98	11.03 (0.11)	Gourd, Pumpkin, Pea, Maize, Greenleaves, Cucumber, Jackfruit, *Monul*, Papaya, *Saru*, Drumstick, *Desialu* Beans, Chilies, Mango, Tamarind, Mustard, Banana, Blackpepper	Brinjal, Cabbage, Ladiesfinger, Onion, Radish, Knol khol, Pineapple, Tomato, Cauliflower, Potato, Lemon, Orange, Guava, Garlic, Zinger	319.71	3.26	29	248.7 (-22.2)	2.54 (-22.1)	22.56 (-22.2)

- The data given above shows that, horticultural plantations in shape of kitchen gardens, backyard plantations owned by 98 study households now cover a total land area of 11.03 acres at an average of 0.11 acres per household.
- The impact of deforestation is also noticed in gradual downslide of horticultural production (-22. 2%) particularly in their backyards and kitchen gardens where they mostly raise conventional crops as it is happening to agricultural production.
- Formerly they were producing their conventional horticultural crops- mostly cucumber, pumpkin, banana, guava etc in their *Badis* for their own consumption. After being motivated by the development agencies, now some Juang farmers they have started raising modern HYV of fruits and vegetables. This trend has begun since a decade.

Shifting Cultivation

Traditionally for the Juang, swidden cultivation has been devised and adopted by them as one of the main mode of subsistence. They grow a variety of crops in their swidden fields, called *Toila* using a small number of simple implements. Their methods are crude; the process is labour intensive and the productivity is low. Now the Juang have learnt in a hard way that this age-old mode of subsistence would no longer sustain their growing population. While they are trying hard to find dependable alternatives, they are yet to abandon this practice altogether.

The following statement presents a picture of the cycle of shifting cultivation, coverage of area, cropping pattern, on going process of decline of production, people's awareness about the causative factors etc in a comparative way. It clearly depicts the declining trend of their traditional mode of subsistence locally called *toila chas*. Normally a *toila* plot is cultivated for 2-3 consecutive years and left fallow for 5-8 years for regeneration. For first year cultivation the plot is called *Toila* in which no cereal crops are grown and only pulses, oilseeds and vegetables are cultivated. In the 2nd year's plot called *Ekan* only cereals, spices and vegetables are cultivated. As its fertility decreases gradually for erosion of topsoil and its nutrients, the area under cultivation between the 1st and 2nd year decreases and so also the number of cultivator families. In exceptional cases, if the land retains some fertility it can be cultivated in the 3rd year to grow paddy and vegetables. This 3rd year plot is called *Nala*. The fertility depends on the soil quality, agro-climate and the regenerative fallow period. The larger the fallow period, the better is the fertility. Now these conditions are worsening day by day. The consequences are visible in the data presented below.

➢ **Underlined crops are no longer cultivated**

- There is gradual reduction in the cultivated area and the number of farmers from the 1st year *(toila)* to the 2nd year *(ekan) Toila chas*.
- Over a period of 10-15 years, the over all quantum of production has decreased by -32.40 percent, the rate of decline being the maximum (-35.96%) in the 2nd year.
- Looking at the negative growth rate of yield for all the three successive years of cultivation of different categories of crops it is found that it is the highest (-36.19%) in case of Cereals closely followed by spices (-35.18%) like Turmeric, Ginger, Chilies etc. Next in the descending order come the vegetables (-30.50%), the pulses (-26.97%), and the lowest being oilseeds (-24.74%)
- The highest rate of decline of yield is noticed in the 1st Year *Toila* (-30.14%) and 2nd year *Ekan* (-43.46%) for spices. It shows that spices, vegetables and cereals are the worst affected crops during all the two-year cycle of *Toila chas*.
- For declining fertility of *Toila*, cultivation of certain variety of crops as underlined in the above statement has been stopped.

ITEMS	ANNUAL YIELD (Approx in Qtls) Average per Acre (Growth Rate) / Average per Farmer					
	1st Year (Toila)		2nd Year (Ekan)		TOTAL	
Total Area (Aprox in Acs)	83.84		51.29		135.13	
Number of Farmers	57		43		100	
Average Area per HH (Ac)	1.48		1.19		1.35	
Cropping Pattern	Past	Present	Past	Present	Past	Present
Cereals *Banki dhan, Kangu, Gangei, Suan, Ragi, Sutun,* Maize	No cereal	crops	131.26	83.75	131.26	83.75
	Grown	In the	2.56	1.63 (-36.19)	2.56	1.63 (-36.19)
	First	year	3.05	1.95	3.05	1.95
Pulses *Arhar, Kalada, Bargudi, Danka, Beans, Kathia, Jhudunga,* Black gram, Horsegram Greengram *Senae, Ruma, Jali*	43.62	32.83	No	Pulses	43.62	32.83
	0.52	0.39 (-24.74)	Grown	In the	0.52	0.39 (-24.74)
	0.77	0.58	2nd	year	0.77	0.58
Oilseeds Til, Castor, Mustard,	23.54	17.19	No	oilseeds	23.54	17.19
	0.28	0.21 (-26.97)	Grown	In the	0.28	0.21 (-26.97)
	0.41	0.30	2nd	year	0.41	0.30
Spices Turmeric, Ginger, Chilies,	6.27	4.38	3.82	2.16	10.09	6.54
	0.07	0.05 (-30.14)	0.07	0.04 (-43.46)	0.07	0.05 (-35.18)
	0.11	0.08	0.09	0.05	0.10	0.07
Vegetables Pumpkin, Gourd, Cucumber, *Kankad, Janhi, Desi Alu, Saru*	20.42	14.33	13.51	9.25	33.93	23.58
	0.24	0.17 (-29.82)	0.26	0.18 (-31.53)	0.25	0.17 (-30.50)
	0.36	0.25	0.31	0.22	0.34	0.24
Total	**93.85**	**68.73**	**148.59**	**95.16**	**242.44**	**163.89**
	1.12	**0.82 (-26.77)**	**2.90**	**1.86 (-35.96)**	**1.79**	**1.21 (-32.40)**
	1.65	**1.21**	**3.46**	**2.21**	**2.42**	**1.64**

Farmers' Major Perceived Reasons for the Production Downslide			
	1st Year (Toila)	2nd Year (Ekan)	TOTAL
Soil Fertility Declining	33 (57.89)	19 (44.19)	52 (52)
Erosion of Fertile Soil	26 (45.61)	14 (32.56)	40 (40)
Inadequate & Erratic Rainfall	17 (29.82)	18 (41.86)	35 (35)
Shorter Fallow Period	12 (21.05)	21 (48.84)	33 (33)

Peoples' Response on Causative Factors

As evident from the Statement, largest number of shifting cultivators (52%) knows that the yield from their *Toila chas* is declining with the decline of soil fertility. 40 percent of them attribute this to soil erosion; 35 percent to uncertain

agro-climate with inadequate and irregular rainfall; and 33 percent, to shorter fallow period.

The regenerative fallow period varies with the subsistence need and the socio-economic status of the farmer as it determines the extent of his dependency on *Toila chas* be it profitable or not. A poor farmer with limited means of livelihood has no choice other than exploiting whatever *Toila* he possesses more frequently to remain alive. So he cannot afford to leave his *Toila* fallow for regeneration for a longer period. In the past the fallow period for poor Juang farmers were 5-10 years and for the well to do it was 9-12 years as the land man ratio was better for smaller population. The situation has changed over period of time. The fallow period has been coming down to 4-7 years and 6-9 years for both the categories of farmers.

Decades ago, the 3rd year cultivation (*Nala*) of cereal crops could be possible. Now the Toila land cannot be exploited for more than two years.

Some of the hill slopes are now degraded for continuous exploitation and turned unfit for *Toila chas*. The people are aware of the fact that the deteriorating ecological conditions would hardy sustain their traditional *Toila chas* but they are left with little choice.

Firewood Collection

Generally, the Juang procure firewood for their domestic consumption from their Toila and surroundings. In the past, vegetations existed in close proximity of their habitations. In an average they were to move within a radius of 1-2 kilometers to gather fuel for their kitchen. With gradual destruction of vegetations and degradation of their Toila this distance has been increasing day by day. Now it has increased to 2-3 kms for the people of the study villages. Obviously this distance increases in the summer months more than those of monsoon and winter times.

Following the gradual decline of their traditional mode of subsistence i.e., *Toila Chas* and Forest collection, since 2 decades, the Juang are trying to make up the deficit by selling firewood in the nearby markets and towns. This has been reflected in the Statement below.

- The above-cited data indicates that though both the sexes shoulder the burden of firewood collection and processing i.e., chopping, splitting and slicing the stock in order to make it ready for use, almost equally with small seasonal variations, women work little more than men for collection and for processing it is the *vice versa*.

Season	Average Distance Covered (kms)		Engagement No of Persons / Mandays = Average per Person				Quantity (Qtls) Total Quantity / 100 Households = Average per Household / (Rate of Decline)					
			Collection		Processing		Collected		Consumed		Sale/ Barter	
	Past	Pres-ent	Men	Women	Men	Women	Past	Present	Past	Present	Past	Present
Summer	1.9	3.0	127	123	119	112	631	448	416	327	215	121
			1935	2012	423	364	6.31	4.48	4.16	3.27	2.15	1.21
			15.23	16.36	3.55	3.25		(-29.0)		(-21.4)		(-43.7)
Winter	1.5	2.6	127	123	93	89	942	813	527	436	415	377
			1762	1823	418	357	9.42	8.13	5.27	4.36	4.15	3.77
			13.87	14.82	4.49	4.01		(-13.7)		(-17.3)		(-9.16)
Monson	1.3	2.1	127	123	87	78	557	422	314	237	243	185
			1545	1719	363	315	5.57	4.22	3.14	2.37	2.43	1.85
			12.17	13.98	4.17	4.03		(-24.2)		(-24.5)		(-23.9)
Total	1.6	2.6	**127**	**123**	**119**	**112**	**2130**	**1683**	**1257**	**1000**	**873**	**683**
			5242	**5554**	**1204**	**1036**	**21.3**	**16.83**	**12.57**	**10.00**	**8.73**	**6.83**
			41.27	**45.15**	**10.12**	**9.25**		**(-21.0)**		**(-20.4)**		**(-21.8)**

- With depletion of the vegetations, the quantity of annual collections and domestic consumption per study households has come down by -21 percent and - 20 percent respectively within last 10 - 15 years.
- Any shortage in firewood is substituted by farm refuses e.g., crop residues, dry leaves etc.
- It is evident from the above data that after meting their domestic consumption needs, they sale the surplus. Following the declining trend this surplus saleable quantity has also come down by –22 percent over this period affecting their family income.
- The Juang are quite aware of the demand-supply gap, which may turn acute in future. They also understand that with the receding tree line and growing population the firewood is going to be scarce in future. Their womenfolk who have to keep their hearths burning are more alarmed than their men about the impending crisis.

Collection of MFP

Except timber all other items of forest produce are classified as Minor Forest Produce (MFP). The endless items of MFP constitute important source of sustenance for the forest dwelling and forest dependent tribals. During drought and adverse climatic condition, tribals' dependence on MFP increases. In the area where job opportunities are few and viable economic alternatives are all but non-existent, this dependence on forest based subsistence activities is significant. Their subsidiary

occupation involves total dependence on MFP for survival for at least three lean months in a year. The consumption pattern of tribals indicates that the MFP is crucial in their economy of subsistence and survival.

Being denizens of forest the Juangs derive a part of their subsistence out of forest-based activities. Their consumption needs are met to a large extent from forest collections round the year. The Juang agriculture yields very little output for reasons like primitive methods and technology, unsuitable land, dependence on rain fed cultivation, agro-climatic fluctuations and ravages of wild animals. The meager output hardly meets their food requirements for half of a year. Hence they depend on the forest for the remaining part of the year to get their food. Their diet is greatly supplemented by fruits, roots, tubers and leaves collected from the jungle and thus food collection still forms an indispensable part of Juang subsistence economy in Juang *pirha* areas of Keonjhar.

Juang men, women and children move into the forest in small groups in search of edible fruits, roots, and tubers round the year. The food materials collected from the forest have seasonal variations. Fruits like mango, jackfruit, *kendu* etc. are plenty in summer and a variety of mushrooms are available during monsoon. Availability of roots and tubers is quite seasonal. These jungle foods break the monotony of their diet by providing a variety of dishes.

They collect a large variety of seasonal minor forest produce like small timber, bamboo, thatching grass, fodder, fruits, roots, seeds, tubers, mushrooms, leaves, flowers, fibers, leaves, barks, herbs, etc to supplement their diet and other requirements. Items like honey, *mohua* flowers, and edible insects, eggs collected from the forest for domestic consumption. Surplus items are sold or bartered in the local weekly hats. Mohua flowers are eaten raw and the surplus is stored for distilling liquor. Mohua seeds are used for extracting oil. They bring head loads of firewood from the jungle regularly for their own use and some Juangs earn a part of their livelihood by selling firewood and charcoal in the nearby markets. They also get timbers, bamboo, *siali* fibre and leaves, palm leaves, *sal* leaves, *kendu* leaves, lac, resin, thatching grass etc. mostly for their own use and often at the time of need they sale these forest produces in the local markets to buy their requirements.

Of much greater importance than income from sale is their need for MFP in their daily lives. The Juang of the study area mostly collect MFP to meet the own consumption needs. Out of so many items they collect, few surplus items of fruits,

roots, tubers, flowers (Mohul), seeds, mushrooms, barks, resin, lac, gums and broomsticks, as given in the following Statement, are sold out after meeting their domestic requirements. All of them depend on MFP for a major portion of their food and for their cattle, fodder and other needs. With depletion of forests these items are in short supply and there are also other difficulties, which is evident from the statement presented below.

In a country in which modern health care is not accessible to the rural inhabitants in general and the rural poor in particular, the tribal have to depend on wild medicinal shrubs, herbs, roots and fruits from the forest. When all these things are added, one can see how dependent the forest dwellers are on MFP for their very survival.

Being forest dwellers they certainly need some bamboo and timber for their houses, agricultural implements and fences. But their needs are minimal compared to the requirements of commerce and industry, which is a major cause of deforestation. On this consideration small timber and bamboo has been added in the categories of MFPs in the following Statement.

The study data thus show the link between deforestation and reduced availability of MFP, additional workload and greater hardship. Because of short supply of MFP, the forest dwellers require much more human power to collect even the minimum required for survival.

The distance between the MFP collectors and the source i.e., the forest has increased between past 10-15 years and the present for all items. About a decade ago various items of MFP were available at a distance varying between 0.5 to 3.8 kms. Now this distance has increased to 1.5 to 5.8 kms. That brings about the hardship to cover larger distance and spend more time in this activity.

Both the sexes shoulder the responsibility of collecting the MFP almost equally. In average, Juang men and women work for about 78 days each in a year for this activity. But Juang women face the hardship more than men because with the increasing distance between them and the source of MFP and dwindling natural resources they have to walk and work for an additional 3 to 4 hours a day to collect MFP and in addition to that, shoulder the burden of household works. Therefore this section of the population is more affected by deforestation.

Type of MFP English Name / LocalName	Collection Time & Season	Average Distance Covered (kms)		Engagement Total Mandays /Total Persons / / Average per Person				Quantity (Approx. in Qtls) Total / Number of Households / Average per Household					
				Collection		Processing		Collection		Consumption		Sale / Barter	
		Past	Present	M	W	M	W	Past	Present	Past	Present	Past	Present
1	2	3	4	5	6	7	8	11	12	13	14	15	16
Small Timber *Sergia, Handa, Aam Gambhari, Mohul, Archungi, Asan, Tedu, Char Karanj, Kumbhi, Kusum, Dhaura, Putudi, Kendu*	Summer Winter	3 2 - 2.5	4 3 - 3.5	367	-	412	-	581	323	320	213	281	110
				123	-	127	-	100	100	100	100	100	73
				2.89	-	3.24	-	5.81	3.23 (-44.4)	3.20	2.13 (-33.4)	2.81	1.51 (-46.3)
Bamboo *Ada*	Summer & Winter	3.79	5.85	416	324	265	236	2961 Nos	2113 Nos	2335 Nos	1642 Nos	626 Nos	471 Nos
				127	123	92	89	100	100	100	100	67	59
				3.28	2.63	2.88	2.65	29.61	21.13 (-28.6)	23.35	16.42 (-29.7)	9.34	7.98 (-14.6)
Grass (Non Fodder) *Along, Panasi, Dabanchan, Maruchan*	Summer & Winter	1.25	3.5	232	267	181	272	635	516	635	516	-	-
				127	123	74	92	100	100	100	100	-	-
				1.83	1.17	2.45	2.96	6.35	5.16 (-18.7)	6.35	5.16 (-18.7)	-	-
Fodder *Haye, Garayngap*	Winter Monsoon	0.75	1.5	806	631	315	422	691	428	691	428	-	-
				98	72	68	82	97	91	97	91	-	-
				8.22	8.76	4.63	5.15	7.12	4.70 (-33.9)	7.12	4.70 (-33.9)	-	-
Barks *Siali, Kusang, Janagreng, Dal Khanda, Asan, Simba, Ludjang, Lankalai*	Summer Winter Monsoon	1.65 1.36 1.20 1.40	2.50 2.70 3.00 2.73	245	218	148	172	17.19	12.26	10.59	8.37	6.60	3.89
				110	135	73	68	100	100	100	100	71	67
				2.23	1.61	2.03	2.53	0.17	0.12 (-29.4)	0.11	0.08 (-27.3)	0.09	0.06 (-33.3)
Plants / Creepers *Samla Siali, Udul, Barengsi*	Summer Winter Monson	2.12	3.25	145	265	97	82	11.05	8.36	6.54	5.12	4.51	3.24
				107	112	58	54	100	100	100	100	86	79
				1.36	2.37	1.67	1.52	0.11	0.08 (-27.3)	0.07	0.05 (-28.6)	0.05	0.04 (-20.0)
Fruits *Aam, Kusum, Anla, Bahada, Jamu, Handa, Kandu, Karanj, Tol, Chindukoi, Char, Kantua, Podul, Tentuli, Sailai, Lankalai, Dimiri, Ambada*	Summer Winter Monsoon	1.25	2.45	835	916	264	322	319.5	212.3	189.6	173.1	120	39.1
				106	123	67	78	100	100	100	100	91	87
				7.96	7.45	3.94	4.13	3.19	2.12 (-33.5)	1.89	1.73 (-8.5)	1.32	0.45 (-65.9)
Roots & Tubers *Mandai, Tima, Bainga, Kaira, Tunga, Pitalu, Kurga, Saiga, Jarai, Panalu, Musakari*	Monsoon Winter	1.50	2.85	278	313	67	324	54.15	38.12	27.18	21.46	27	16.66
				115	123	78	106	100	97	100	97	73	69
				2.42	2.54	0.86	3.06	0.54	0.39 (-27.8)	0.27	0.22 (-18.5)	0.37	0.24 (-35.1)

Leaves *Sal, Lalaisan Kendu Gadin Kulian, Pururi Mutrunga, Pita Mansa, Ambat Chunchunia, Nahnga, Siali*	Winter Monson	1 50	2 50	197	433	95	192	16 43	11 22	11 36	9.54	5 07	1 68
				112	119	98	120	100	100	100	100	93	87
				1 76	3 64	0.97	1 60	0 16	0 11 (-31 3)	0 11	0 09 (-18 2)	0 05	0 02 (-60)
Flowers *Mohul, Gilin Kanchan*	Summer Monson	1 15	2 50	121	167	88	145	47 39	32 28	31 42	23 58	15 97	8 7
				105	116	67	105	96	93	96	89	68	56
				1 15	1 44	1 31	1 38	0 49	0 35 (-28 6)	0 33	0 36 (-21 2)	0 23	0 16 (-30 4)
Seeds *Mohul, Sargia, Karanj, Neem, Harda, Palas Bahada,*	Summer	1 15	2 5	238	392	196	255	27 84	19 65	22 42	15 69	5 42	3 96
				97	120	56	91	93	89	86	78	71	68
				2 45	3 27	3 5	2 8	0 3	0 22 (-26 7)	0 26	0 2 (-23 1)	0 07	0 06 (-14 3)
Mushrooms *Bali, Baunter, Onal, Sinduria Kantulab, Jaru Indusuti, Laya Adilang Karep, Narangai Bijuli, Pathar Kalara jagerap, Keredai,*	Monson	1	2 35	279	473	-	264	32.83	23 45	17 52	12 69	15 3	10 76
				1 27	1 23	-	1 23	100	100	100	100	94	88
				2 19	3 84	-	2 15	0 33	0 23 (-30 3)	0 18	0 13 (-27 8)	0 16	0 12 (-25)
Herbs *Patalgarud, Ajadagada, Pitudi, Kurei Musakani, gangasiuli banalimba*	Summer Winter Monson	1 56	3 28	116	-	116	-	6 34	4 72	6 34	4 72	-	-
				47	-	47	-	47	47	47	47	-	-
				2.47	-	2 47	-	0 13	0 10 (-23 1)	0 13	0 10 (-23 1)	-	-
Resin *Segan*	Summer	1 25	4 78	164	-	109	-	5 25	3 39	2 64	1 89	2 61	1 50
				105	-	48	-	100	100	100	100	36	29
				1 56	-	2 27	-	0 05	0 03 (-40)	0 03	0 02 (-33 3)	0 07	0 05 (-28 6)
Gums *Madang*	Summer Winter	0.50	2 35	39	48	27	31	0 63	0 48	0 63	0 48	-	-
				112	73	54	66	52	44	52	44	-	-
				0 35	0 66	0 50	0 47	0 01	0 01 (-23 8)	0 01	0 01 (-23 8)	-	-
Broomstick *Jenab, Sarka Alo, Phulbarani*	Winter	1 85	3 25	198	278	48	205	16 75	9 64	8 74	6 35	8 01	3 29
				127	123	74	95	97	91	92	87	59	78
				1 56	2 26	0 65	2 16	0 17	0 11 (-35 3)	0 09	0 07 (-22 2)	0 09	0 04 (-55 5)
Others (Specify) *Lac, Adaksaradi*	Monson Summer	3 5	5 80	57	173	-	163	12.81	8 32	10 78	7 43	2 01	0 89
				83	96	-	98	98	89	98	89	23	19
				0 69	1 80	-	1 66	0 13	0 09 (-30 8)	0 11	0 08 (-27 3)	0 09	0 05 (-44 5)
TOTAL				**43.0**	**44.4**	**34.7**	**34.2**	**2475.2**	**1651.1**				

The reduction in the procurement of MFP between past and present is visible in all categories. The highest decline is in small timber (-44.4 %), followed by resin (- 40 %) and the lowest, being in grass (- 18.7%). The rate of decline ranges between -30 percent and -35 percent for items like Broomsticks (-35.3%), Fodder (-34%), Fruits (-33.5%), Leaves (-31.3%), Lac (-30.8 %) and Mushrooms (-30.3 %). It is between -23 and -29 percent for items like Barks (29.41 %), Bamboo (-28.64 %), Roots & Tubers (-27.8 %), Flowers (-28.6 %), Plants & Creepers, (-27.3 %), Seeds (-26.7 %) and Gums (-23.8 %) and Herbs (23 %). The overall downslide comes to –30.77 percent for all the categories. As a result their average household consumption of all these items have come down proportionately by -34 percent to -8 percent and created deficits by unbalancing the equation of demand and supply. Likewise their volume of sale of the surplus MFP have shrunk from 66 percent to 14 percent for different categories causing economic hardship to them.

Majority of the respondents feel that the problem itself is the result of deforestation and the consequent lack of access to MFP. The data given above seem to endorse this. The first indication is the difference between the past and present in the collection, consumption and sale of MFP. This is attributable primarily, if not exclusively, to the shrinkage of the available forest area and the consequent difficulties in access to the dwindling resources.

Possession of Livestock

The Juang rear animals to meet their agricultural and consumption needs. When natural vegetations were abundant there were no problems to maintain their livestock. Now the population of these animals is decreasing with depletion of forests and decline in agricultural production. This diminishing trend is visible in the comparative data presented in the following statement.

- The data indicates that animal population has decreased by -35.62 percent with the average livestock per household shrinking from 12 to 8 animals over last 10 –15 years.
- The highest negative growth rate (-59.46 %) is recorded in case of pigs followed by buffaloes (-56.76 %), bullocks (- 45.73 %) and cows (-36.74 %), the lowest (-23.53 %) being the goats.
- The people have revealed the reasons for this situation. The largest number (87.50 %) of respondents cited about social taboos and prohibition against rearing pigs as a social mobility tactic, which is reflected in the present pig population registering the highest rate of decline among all categories of domestic animals.

Types of Animals	Number		Reasons for Change (Percentage of Response)				
	Total Animals / Total Households possessing / Average per Household		Shrinkage of Grazing Sources	Shortage of Fodder	Drying up of Water Sources	Shortage of Manpower for tending Livestock	Fear of Taboos & Social Sanctions
	Past	Present (Growth Rate)					
Bullocks	293	159 (-45.73)	80.72	19.28	-	3.61	-
	91	83					
	3.22	1.92					
Buffaloes	37	16 (-56.76)	71.43	42.86	85.71	28.57	-
	14	7					
	2.64	2.29					
Cows	215	136 (-36.74)	76.79	-	-	58.93	
	68	56					
	3.16	2.43					
Goats	289	221 (-23.53)	59.42	-	-	24.63	
	43	28					
	4.13	3.46					
Pigs	37	15 (-59.46)	-	-	37.50	-	87.50
	17	8					
	2.18	1.87					
Poultry	356	243 (-31.74)	81.61% premature death for unknown disease				
	93	87					
	3.83	2.79					
Total	1227	790 (-35.62)	72.09	31.07	61.60	28.94	87.50
	100	100					
	12.27	7.90					

- 72 percent of the respondents attribute this decline to shrinking of sources for grazing the animals and 62 percent, to drying up of water sources. Particularly, the populations of buffaloes and bullocks have been affected by these factors.
- Since the past, goat rearing has been a common traditional economic pursuit that fetches supplementary income. It has been affected for shrinkage of grazing sources and shortage of manpower for tending the stock as now the Juang children who generally are engaged for grazing goats are being persuaded to attend schools.

Indebtedness & Bondage

It is a well-known fact that the deficit caused by decline of traditional forest based subsistence activities drives the gullible tribals into the maze of indebtedness and bondage. Once a tribal incurs debt from a local *sahukar*, he is trapped in a net from which he cannot wriggle out very easily. He and his children live in debt and die in debt. Indebtedness in most cases leads to bondage and land alienation. The exorbitant rates of interest charged by the local private moneylenders makes the

repayment of loan impossible and invariably the cunning moneylender deprives the client of his income from his land, MFP, livestock and other produces and finally acquires the client's land and other valuable economic assets. The worst victims are the poorer and landless sections who have no other options.

When the Juang incurs debts from a private moneylender, he almost sinks under the burden of repayment. It leads to land alienation and loss of property. In the Juang area the moneylenders are mostly the non-tribals. Very often the Juang is unable to repay and free himself from the clutches of the lender. In the process be loses all he owns.

This kind of situation was prevailing in the study area till the recent past. But now, thanks to the tribal and rural development programmes, the circumstances have changed. Nationalised Banks and Self Help Groups (SHGs) have come to their rescue. Yet the dishonest private lenders are still there. It is not easy to neutralize their age-old spell on the vulnerable Juangs. The silver lining is that the level of awareness of the people is increasing.

Source	Number of Loanee Households	Position of Indebtedness				
		Total Amount of Loan Taken (Rs) / Average per Household	Total Amount Repaid (Rs) / Average per Household	Total Amount Outstanding / Average per Household (Rs)	Whether Land or any economic Asset alienated for repayment	If Indebtedness caused Bondage
Boitarani Gramya Bank	27	2 15 200 / 7970	80 850 / 2994	1 34 350 / 4976	Land	No
Self Help Groups (Mandghar)	4	1200 / 300	700 / 175	500 / 125	Nil	No
Private	3	2200 / 733	1400 / 467	800 / 267	Nil	No
Total	34	2 18 600 / 6 429 (100)	82 950 / 2440 (37 95)	1 35 650 / 3 990 (62 05)		

The above statement shows that presently, the District Rural Bank i.e., Boitarani Gramya Bank has advanced fairly larger amounts of loans to the people than the local moneylenders. The position of repayment of loans by the loanees is not so good i.e., 36.6 percent only. Large inflow of institutional finance has pushed the greedy private financers to the backstage, removing their grip over the vulnerable sections. But the application of the concept of Micro Credit through Self Help Groups has not made much headway into the Juang economy so far.

Household Income

The data on average annual household income presented in the following Statement is self-explanatory. Between past and present, the average income rose by 39.18 %.

The highest part of the income i.e., 40.51 percent in the past and 43.11 percent in the present comes from settled agriculture including wetland (Bila/ Beda) cultivation of paddy and mixed cultivation in up and dry lands (Guda). This marginal rise in the share of income from settled agriculture may be attributed to the Juang farmers' increased dependence on this sector and popular acceptance of agricultural development schemes following decline of incomes from traditional sectors like shifting cultivation, Forest Collection, Animal Husbandry, Hunting

Sl. No.	Sources of Income	Average Amount of Annual Income (Rs)	
		Past (10 Years)	Present
1.	Agriculture	3 79 251 (40.51%)	5 61 746 (43.11 %)
2.	Shifting Cultivation	1 23 693 (13.21%)	98 574 (7.57 %)
3.	Horticulture--		
	Backyard & Kitchen Garden	61 762 (6.60 %)	47 923 (3.68 %)
4.	Animal Husbandry	31 407 (3.35 %)	22 185 (1.70 %)
5.	Forest Collection	2 18 718 (23.36 %)	1 97 204 (15.13 %)
6.	Hunting	3 643 (0.39 %)	1 712 (0.13 %)
7.	Fishing	1 892 (0.20 %)	1 015 (0.08 %)
8.	Wage and Labour	72 165 (7.71 %)	96 353 (7.39 %)
9.	Rural Industry	1 591 (0.17 %)	1 167 (0.09 %)
10.	Trade / Barter	1 287 (0.14 %)	2 392 (0.18 %)
11.	Gift / Exchange	13 705 (1.46 %)	28 471 (2.18 %)
12.	Service	27 196 (2.90 %)	2 44 433 (18.76%)
	Total	**9 36 310 (100 %)**	**13 03 175 (100 %)**
Average per Household (Growth Rate)		**9 363.10**	**13 031. 75 (39.18 %)**

The second highest income is reported in the past from Forest Collection (23.36 %) and in the present from Service (18.76%). With gradual depletion of forest resources over period of time, the quantum of income from Forest Collection- the age-old perennial source has been reducing day by day down grading its position to the 3rd (15.13 %).

Like that of forest collections another important age-old forest based source of subsistence i.e., the shifting cultivation has been declining. Consequently its contribution to household income has come down from 13.21% to 7.57 % over past 10-15 years downgrading its rank from 3rd to 4th.

Following the decline of forest resources, people are looking for alternatives in other avenues like Wage Earning, Service, Trade & Barter to supplement their income and make up the deficit. Yet due to availability of limited avenues for wage labour the share of earnings from this sector has remained the same but its position has declined from 4th to 5th.

The income from backyards & kitchen garden sector have decreased from 6.60 percent to 3.68 percent reducing its position from 5th to 6th and indicating indifference of the Juang farmers towards horticulture development schemes.

Moreover, deforestation and the ban on hunting have affected the incomes from allied sectors like animal husbandry, hunting and rural industry that is largely dependent on forest resources. While animal husbandry has gone down from the 6th t0 8th position and the hunting, from 9th to 10th position, rural industry has retained its rank at the 11th place, but its share has gone down from 0.17 percent to 0.09 percent. In case of hunting the income has reduced to one third making it a mere ritual activity and for animal husbandry the rate of decline is about 50 percent.

Fishing has never been a significant economic activity for the Juang. In terms of its contribution to household income it is negligible. As such it holds the 10th rank in the past and the lowest rank in the present. This too has declined by 60 percent..

Thus it is found that the shares of earning from large number of economic sectors i.e., 8 out of total 12 has declined over past 10-15 years. Sectors like shifting cultivation, horticulture, animal husbandry, rural industry, hunting and fishing have registered major decline – ie 50 percent more or less and that out of remaining 2, wage earning has shown marginal decline and forest collections a moderate decline of about 30 percent. Conversely, significant growth of income has been reported from sectors like service (lifting its position from 7th to 2nd) and gift & exchange and marginal growth, from agriculture and trade and barter.

Household Expenditure

The data on average annual expenditure of the study households presented in the following statement shows that the quantum of expenditure has increased by 32 percent between then and now.

Among all the heads the highest average household expenditure has been made on fooding and the second highest on, house construction and maintenance

and as such both have maintained their 1st and 2nd positions not only in the past but also in the present circumstances. A decade ago the total share of expenditure on both the heads accounted for 57.06 percent of the all-total average household expenditure. This has marginally reduced to 52.75 percent at present. Always it has remained over 50 percent.

The expenditure has been the lowest on payment of land revenue in the past and on rural industry in the present. Their positions have been interchanged between 17th and 18th during this period.

Expenses on majority of heads i.e., 12 out of 18 such as, Shifting Cultivation, Horticulture, Rural Industry, Dress & Ornaments, Rituals & Festivals, Entertainment of Guests, Treatment of Diseases, Education & Training, Construction & Repair of House, Litigation, Fuel & Fodder and Fooding has come down in percentage terms i.e., from 6.17 %, 0.33 %, 0.09 %, 7.75 %, 6.36 %, 2.14 %, 2.77 %, 1.85 %, 11.76 %, 0.26 %, 0.83 % and 45.30% in the past to 5.60 %, 0.17 %, 0.02 %, 6.97 %, 5.49 %, 2.08 %, 2.39 %, 1.65 %, 9.11 % 0.10 %, 0.71 and 43.64 % respectively in the present.

The share of expenditure has gone up significantly on Repayment of Loan and Purchase of Durable Assets from 2.27% and 0.73% to 6.03% and 2.83% upgrading their places from 14th to 9th and 10th to 5th respectively. It indicates peoples' interest towards modern way of life. Marginal increase is noticed in the remaining 4 heads such as Agriculture (5.38% to 7.21%), Drinks & Intoxicants (2.27% to 2.56%), Land Revenue (0.08% to 0.09%) and Gift & Exchange (3.16 to 3.35%).

Besides Fooding and House Construction, the only other heads, which has held its ranks at the 16th place consistently over period of time, is Litigation. However in percentage terms its share has changed from 0.26 % to 0.10 %.

The pattern of average annual household expenditure of the Juang study households have shown some changes over the past decade. Trends of modernization are visible, in expenditure hike in acquisition of durable household assets, agriculture, gift and exchange and repayment of loans. For agriculture and debt redemption the reason lies in acceptance of modern agricultural development schemes and liberal debt financing by local rural bank under various development schemes. Since some of the studied families have been allotted Indira Awas Houses the overall spending on house construction and maintenance has not increased much.

Sl. No.	Heads of Expenditure	Average Amount of Annual Expenditure (Rs)	
		Past (10 Years)	Present
1.	Agriculture	53 692 (5.38%)	94 716 (7.21%)
2.	Shifting Cultivation	61 547 (6.17%)	73 539 (5.60%)
3.	Horticulture	3 252 (0.33%)	2 171 (0.17%)
4.	Rural Industry	935 (0.09%)	317 (0.02%)
5.	Dress & Ornaments	77 312 (7.75%)	91 625 (6.97%)
6.	Rituals & Festivals	63 495 (6.36%)	72 138 (5.49%)
7.	Drinks & Intoxicants	27 641 (2.27%)	33 641 (2.56%)
8.	Entertainment of Guests	21 374 (2.14%)	27 292 (2.08%)
9.	Treatment of Diseases	27 649 (2.77%)	31 418 (2.39%)
10.	Education & Training	18 483 (1.85%)	21 735 (1.65%)
11.	Purchase of Durable Assets	22 635 (2.27%)	79 162 (6.03%)
12.	Land Revenue	823 (0.08%)	1 138 (0.09%)
13.	Construction & Repair of House	1 17 415 (11.76%)	1 19 650 (9.11%)
14.	Litigation	2 650 (0.26%)	1 270 (0.10%)
15.	Gift & Exchange	31 512 (3.16%)	43 965 (3.35%)
16.	Fuel & Fodder	8 322 (0.83%)	9 328 (0.71%)
17.	Fooding	4 52 167 (45.30%)	5 73 291 (43.64%)
18.	Repayment of Loan	7 250 (0.73%)	37 250 (2.83%)
	Total	9 98 199 (100%)	13 13 646 (100%)
	Average per Household (Growth Rate %)	**9 981.99**	**13 136.46 (31. 60)**

The annual income and expenditure data of the study households is indicative of the fact that all of them are Below the Poverty Line (BPL).

Being a forest dwelling folk, the socio-cultural life of the Juang developed amidst the forest environment, since the hoary past. As such their life and culture is so inseparably linked with the forest that they cannot think of their survival without the forest. Like a loving mother, forest meets most of their needs. They regard the forest as a permanent gift of the 'Mother Earth' (whom they regard as one of their Supreme Deity and call *Basukimata* – the Earth Goddess), which they have inherited from their forefathers. They worship a number of deities residing in the hills, forests, fields, rivers, streams namely *Thanpati, Boitaranipat, Gutipat, Rangapat, Kalapat* etc. in all major rituals they pay homage to these deities to seek their blessing and protection. Particularly in the *pirha puja* festival held in July-August, they pray the forest and hill deities. Their strong emotional attachment with the forest makes them quite possessive about it and they always treat it as their own property. However they understand quite well that forest resources are limited and they shall be the worst sufferer if greedy and irresponsible human beings destroy forests. They have developed their own cultural norms for the management and protection of their forest resources.

It is a sorry state of affairs that the receding forest line is not a good sign for sustainable development of forest and tribals like the Juang.

SUMMARY FINDINGS

Background

Today a serious matter of worldwide concern is the phenomenon of degradation of the natural environment as a direct consequence of deforestation precipitated by a situation of over-exploitation of natural resources. Large tracts of moist tropical vegetations are disappearing fast from the earth's surface day by day. Now more than anybody else, the tribal folks who have been the denizens of forest since time immemorial stand at the receiving end of the disaster as its worst victims.

Tribal communities living close to the nature since the hoary past have developed a symbiotic relationship with the forest. They depend heavily on the forest for their livelihood, shelter, occupation and employment. To them forest is not merely a perennial and renewable natural resource for fulfillment of their basic needs but also the very foundation of their culture exemplifying the age-old serene pattern of coexistence between man and nature. Their folklore, religion and worldview are woven round the forest. Therefore their social and economic well-being can not be ensured ignoring their dependency on the forest eco system.

In India this age old harmony of man with nature has been affected since the time of colonial administration. The major reasons are population growth, industrialization and urbanization, development and especially the commercial exploitation of forest resources based upon the policy of treating the forests as national wealth and its continuance even after independence. This has started a trend of massive deforestation on one hand and erosion of age-old traditional rights of the tribesmen and their nature of relationship with the forest on the other making them the worst victims of deforestation. The Odishan tribes are no exception.

The gravity of the situation of deforestation can be assessed from the fact that, at the time of independence nearly one fourth (23%) of India's land area was under forest cover and now it has come down to less than one tenth. It is said, India has been loosing on an average 1.3 million hectares of forests every year. In absolute terms of the extent of the area of deforestation, Odisha comes among the top three most affected states. Forests that covered nearly 40 percent of the state's land area has dropped below 20 percent.

In Odisha, the majority of forest dwelling tribals are socially, economically and educationally backward and relatively under-exposed to the outside world. They live in the remote hilly areas, many of them primarily being dependent on shifting cultivation and minor forest produce (MFP). In other words, they depend on the forests for their very survival. Consequences of deforestation have subjected them to untold miseries and sufferings.

Present Study

With this backdrop this study has been undertaken to assess the effects of deforestation among two Primitive Tribal Groups (PTGs) i.e., the Lanjia Saora of Puttasing of southern Odisha and the Juang-the autochthones of Gonasika hills of Keonjhar district in northern Odisha who live in a simple society and inhabit remote forest areas in a state of semi-isolation and thrive upon a subsistence economy based on land and forest.

This exploratory study has covered one hundred households in 12 selected Lanjia Saora settlements located in Puttasing area of Rayagada district and the equal number of households in 10 Juang settlements in Gonasika area of Keonjhar district. The quantitative data on aspects like population, literacy, marital status, health status, occupations and employment, traditional skills, indebtedness, livestock, agriculture, horticulture and shifting cultivation, and collection of MFP, household income and expenditure pattern etc. has been collected by administration of a set of Household Schedules. Qualitative data, on socio-cultural, economic and environmental impacts of deforestation has been gathered through personal interviews, group discussion, non-participant observation, interaction with key informants and community leaders and recording of case studies with the help of an Interview Guide. In both the ways an attempt has been made to elicit comparative data on important aspects of the problem as they were in the past, 10-15 years back and the changes, if any, occurred at present i.e., at the time of this study. Relevant secondary data has been elicited from available references.

The Study Areas

Puttasing

The study area of Puttasing is a rugged, mountainous highland country predominantly inhabited by the **Lanjia Saora**. This picturesque territory with its undulating terrain, rolling hills, terraced paddy fields, perennial hill streams and patches

of lush green forests lies at an average elevation of 2000' above the mean sea level. It froms a natural geographic unit, comprising fertile valleys of the Vamsadhara and its tributaries between the mountain ranges of the Eastern Ghats. The soil type is red laterite on the hills. Brown to black soil is seen on the hill bottoms and valleys. Due to shifting cultivation and deforestation, soil erosion is evident on the denuded hills. The flora of this region is predominantly composed of moist peninsular Sal (*Shorea robusta*) forests in the valleys and hill ranges standing at an elevation of 590' to 5000'.

The contribution of forest to the economic life of the Saora is very significant. In the past it was a wild country rich in natural wealth of flora and fauna. Tigers, jackals, bears, leopards, panthers, wild dogs, elephants, porcupines, Sambars, wild pigs and goats, fowls, deers, monkeys, peacocks, pythons, cobras were roaming in the wilderness. Now the fauna is almost depleted with the forest.

The climatic condition of the region is more like that of the Deccan plateau. Because of its elevation, the area experiences a mild and moderate climate, with a short and mild summer, moderate monsoon and a long winter. The spatial distribution of rainfall in this area is largely influenced by the Eastern Ghats.

Gonasika

The **Juang** are largely concentrated in the district of Keonjhar followed by the adjoining undivided district of Dhenkanal. Their habitat forms a contiguous belt extending from the hills in the west of Keonjhar to the hill ranges of Pallahara of Angul district and its adjoining plains. This area has a large number of hills and valleys intercepted by a network of perennial streams and rivers like Boitarani and Brahmani. The soil varies from rich loam to gravelly detritus of the hill slopes except plains that are fertile.

The Juang claim Keonjhar as their homeland. Their stronghold area in Keonjhar district is called *Juang pirha*. It is a triangular piece of country divided into four traditional maximal territorial units like Jharkhand *pirha*, Sathkhand *pirha*, Rebena *pirha* and Kathua *pirha* with a roughly north to south alignment along a range of hills with Keonjhar at it's apex and Kuanr and Basantapur at it's base. In the centre of the Juang country lies Gonasika, the holy birthplace of the Juang tribe and the sacred river Baitarani. Other Juang villages surround it. The sylvan surroundings guarantee the tribe an isolation in which they live in their own style.

This picturesque territory with its undulating terrain, rolling hills, perennial hill streams and patches of lush green forests lies at an average elevation of 2000'-3000' above the sea level. This lovely highland country is dotted with hundreds of Juang villages of which 35 have been covered by the PTG Development Micro Project named **Juang Development Agency (JDA)** headquartered at Gonasika. It is situated at a distance of 35 kilometers from the district headquarters i.e., the Keonjhar town and approachable by an all-weather *pucca* road.

For abundant rainfall and altitude variation the forests in this region support varieties of vegetations. The contribution of forest to the economic life of the Juang is very significant. In the past, the area was under thick forest cover. But now only patches of vegetations are left. The practice of shifting cultivation and destruction of forests has made the wild animals scarce in the area.

Years ago it was a wild country endowed with abundant flora and fauna. Wild animals were roaming in its wilderness. Now the fauna has almost vanished with the forest. However, often herds of elephants cause some damage to the crops and march into the human habitations in search of food.

The area experiences a mild and moderate climate, with a short and mild summer, moderate monsoon and a long winter. In the summer season the temperature rises up to 40°c. The winter lasts from December to February. During monsoon rains are incessant. The annual average rainfall is about 1400 mm to 1550 mm.

The Tribes

Lanjia Saora

The Lanjia Saora represent a primitive section of the great ancient tribe "Saora" or "Savara". They are not only numerically important but also a historically and culturally significant tribal community of the State. According to a legendary tradition, they have been intimately associated with the cult of Lord Jagannath, who originated as a tribal deity and was later brought to Puri under royal patronage.

The tribe has their racial affinity with the proto-Australoid stock and speak an ancient Mundari dialect of their own called 'Sora'.

The **Saora** are found in almost all the districts of the State. But their main concentration lies in a contiguous mountainous territory of the Eastern Ghats in

Rayagada and Gajapati districts in Southern Odisha. Their population as per 1991census was 4,03,510 accounting for 5.74 percent of the total tribal population of the state. Their decennial growth rate (1981- 1991) was 9.04 per cent and sex ratio, 1015 in 1991. Educationally, they are backward with only 25.58 per cent literacy in 1991.

The exact population of the **Lanjia Saora** is not available. However according to an enumeration made by SCSTRTI on 2001-02, their population in the two Micro Projects areas viz, LSDA, Puttasing and LSDA, Serango is 7,587.

The Lanjia Saora are famous for their expertise in terrace cultivation, shifting cultivation, elaborately religious lifestyle, artistic skills for producing beautiful wall paintings or pictograms popularly known as icons and their peculiar traditional male dress-style in which the ends of the loin cloth hangs like a tail at the back. The term "Lanjia" meaning "having a tail" has been bestowed upon them by their neighbours referring to the fashion of wearing long tailed lion cloth by their male folk.

The subsistence economy of the Lanjia Saora rests primarily on slash-and burn agriculture and importantly on terrace cultivation. It is supplemented by wage earning and round the year forest collections. Individual ownership of the swidden plots is recognized on a hereditary basis. They exhibit a high degree of indigenous skill, ingenuity and technological outfit for preparing the terraces with inbuilt water management system. Mainly they grow rice in terraced fields and a variety of minor millets, cereals, and pulses in the swiddens. Among many remarkable features of their socio-economic life is their traditional system of labour cooperative called *ansir*, which ensures them supply of labour for labour intensive operations like swidden cultivation, house construction, terrace making and terrace cultivation, and other activities in the village.

The Saora social organization is distinguished by absence of exogamous clans. The main exogamous unit is the patrilineally extended family descended from a common male ancestor, called *birinda*. Women even after marriage continue to belong to the brother's *birinda*.

The Lanjia Saora pantheon includes numerous gods, deities and spirits, who are worshipped with fear and anxiety. People offer sacrifices for their safety and well-being. Most of the festivals revolve round agricultural cycle and lifecycle rituals. To commemorate the dead *Guar* is celebrated. In their society, the fear of religion is

the most potent factor for ensuring social conformity and it acts as a powerful deterrent against breach of established customs.

Their aesthetic life manifests through colourful dance, music and the wall paintings, *anital*, in particular. The icons are so skillfully dreamt and drawn that these have made them famous among the scholars and artists of the country and aboard.

Their traditional village organization possesses, a well-defined territory, a hierarchy of responsible leadership and a traditional village council called "Birinda Neti". There are a secular headman (Gomango/Naiko), a sacerdotal headman (Buya / Karji / Jani), headman's subordinates- (Mandal / Dal Behera), messenger (Barik), astrologer (Disari) and Shaman (Kudan / Beju). The village affairs are decided in village meetings chaired by the Gomango.

In modern times, rapid changes in administrative set-up and political climate of the country and their exposure to the external modern world have influenced the Saora way of life and contributed to modernize their political organization. Various welfare measures initiated by the Government have also enhanced their contacts, outlook and awareness. The Lanjia Saora have been identified as a Particularly Vulnerable Tribal Group (PTG) in Odisha. For their all round development, two Micro Projects, one located at Puttasing in Rayagada district and another at Serango in Gajapati district have been established.

Juang

Juang is one of the primitive tribal groups exclusively found in Odisha. In the past, they were being called 'Pattoa' for wearing leaves. The word *'Juang'* means, "Man". They claim themselves to be the first humans on the earth, originating at the sacred Gonasika hills as descendants of their legendary ancestors, the *Risi* couple. They firmly believe that they are the *Thanyas*, the autochthons of Keonjhar as compared to their brethren who have fled to the neighbouring Pallahara area in the long past, distinguished as *Bhagudias*, the emigrants.

Linguistically Juangs are Mundari speaking people and racially belong to Proto-Australoid stock. As per 1991 census their total population is 35665 and sex ratio is 1059. In 1991 their literacy was 14.46 %.

The Hill-Juang villages of Gonasika area are grouped under four *pirhas* - territorially organized confederation of villages, named as Satkhand, Jharkhand, Kathua and Rebena which had received due recognition and patronage of the then rulers of

ex-Keonjhar State. Each *pirha* is led by a traditional tribal chief designated as *Sardar*. Each Juang village is an autonomous socio-political unit managed by a set of traditional leaders and a corporate body of village elders called *bhalabhai* or *barabhai*. The village community owns and manages all the productive and useful natural resources like swiddens, forests, grazing land, and habitation sites etc., which lie within their village boundary.

Another important feature of the Juang society is their traditional youth organization and dormitory, *majang* or *mandaghar*. The unmarried boys and girls become members of this institution and undertake various public services and socio-cultural activities for their community. They sing, dance and make merry in moonlit nights in front of *majang*. The *majang*, a rectangular house standing high in the center of the village serves as a community house for the youth, court house for the council of elders (*barabhai*), guest house for visitors, cooperative store for storage of common grains, place for keeping musical instruments, a venue for communal rituals, and cultural center for dance and music.

The other distinguishing features of the Juang are their strong kinship organization dividing them into *kutum* (kins), and *bandhu* (affines). Most of the Juang villages have uni-clan composition; village exogamy is the rule.

The Hill-Juang eke out subsistence pursuing shifting cultivation and collecting minor forest produce. The plains-Juang earn their livelihood by pursuing small-scale settled cultivation and wage earning

Impact of Deforestation on Environment

The forests as a whole function as the biomass system that maintains the ecological balance to provide a life support system for the animal kingdom. This balance disappears with deforestation as it leads to environmental deterioration. Today the disastrous consequences of deforestation manifests in shapes of soil erosion due to inadequate tree cover, drought due to loss of ground water storage, floods due to run off water and landslides due to the denudation of hills.

Now the Lanjia Saora of Puttasing, and the Juang of Gonasika have come to realize that the destruction of forests leads to the deterioration of human beings, especially those belonging to the weaker sections like themselves as they have been depending on nature for their very survival. Consequently, the environment degradation hits them harder than any other. Their community leaders have expressed such views during informal interviews and group discussions.

In their perception:-

- The area under forest coverage as well as the forest density has reduced very highly by 60-75 percent.
- Forests that surrounded their villages 2-3 decades back have now receded 2-10 kms for the Lanjia Saora of Puttasing and 3-7 kms for the Juang of Gonasika.
- Deforestation has highly affected their natural environment. It is visible in deterioration of the soil through the ongoing process of soil erosion, loss of soil nutrients, fertility and moisture.
- The felling of evergreen trees with large leaves that protected land from the summer sun and retained soil moisture, leads to the lowering of the water table, reduction of moisture in the atmosphere and the consequent decrease in rain or erratic rainfall.
- The consequences of the ecological imbalance hit them in shapes of drying of water sources, unpredictable climatic conditions, rise in atmospheric temperature, flood and draught, acute shortage of drinking water, decrease in yield from agriculture and horticulture, scarcity of food for crop failure and shortage of fodder etc.
- The equation of their age-old dependence on the forest has been disturbed by deforestation.

Destruction of forests is not merely disappearance of trees but of the resources on which the tribal economy, culture, social life and religion depend. Consequently, the destruction of their habitant does not merely deprive them of their very life support system but sets a new destructive process in motion that is harmful to their life and culture.

Effects of Deforestation: Socio-Economic

Tribals are inseparable from forest not only ecologically but economically too. The denizens of forest traditionally depend on the forest flora and fauna for their livelihood and thrive on subsistence economy derived out of hunting, food gathering and shifting cultivation because they have few viable economic alternatives and employment opportunities. They collect various kinds of Minor Forest Produce (MFP) in different seasons and satisfy their numerous needs from the forest with the help of most simple implements and without any external technological aid.

Therefore it is now important to know how deforestation has affected their age-old dependence on the forest and its consequences.

Though, Odisha is comparatively rich in forest resources, the living standards of its people and especially the tribals is very low since, majority of the forest dwelling tribes are economically backward, pre-literate and underexposed to the outside world.

The **Lanjia Saora** have lived with the forest for centuries and built up a symbiotic relationship with forest in context of their social, cultural and occupational life. They inhabit clusters of villages mainly in the interior hilly areas, depending primarily on shifting cultivation and minor forest produce (MFP). As they have been depending on the forests for their very survival from time immemorial, wanton destruction of forests has not only disturbed the ecological balance but also put pressure on the diminishing forest resources. Consequently they find it difficult to pursue their traditional occupations and sustain their livelihood as their perennial source of subsistence is disintegrating in these days.

The **Juang** are economically backward, pre-literate and underexposed to the outside world. They lived with the forest for centuries inhabiting clusters of villages mainly in the hilly areas, dependent primarily on shifting cultivation and minor forest produce (MFP) and thus built up a symbiotic link with forest in the context of their social, cultural and economic life. They regard the forest as a permanent gift of the mother earth (called Basukimata - their Supreme Deity), which they have inherited from their forefathers. Depletion of forests has not only disturbed the ecological balance but also put pressure on the forest resources as well as the Juang as forest dwellers. Now they find it extremely difficult to sustain their livelihood and to pursue their traditional occupations because their perennial source of subsistence is dwindling over period of time.

In this situation, it becomes imperative to understand the magnitude and direction of the impact of deforestation on the socio-economic living conditions of the tribes especially with reference to their occupational position, social and cultural life, living standard and economy as a whole.

Study Villages

The 12 study villages are inhabited exclusively by the **Lanjia Saora**. 11 of these are inside the micro project, LSDA area and the remaining one just lying on

the periphery of the project area. 100 Lanjia Saora households belonging to these 12 villages/ hamlets were covered under the study.

The 100 **Juang** households covered under the study belonged to 10 villages of which 9 are inside the JDA micro project area and the remaining one i.e., Kuanr is outside the micro project area. These villages come under 5 gram *panchayats* inside Banspal block.

Population, Marital Status & Literacy in Study Households

The 100 **Lanjia Saora** study households have a total population of 662 including 322 males and 340 females showing an average household size of 6.6 and also the numerical superiority of females over males; the sex ratio being 1056 females for 1000 males.

Because the Lanjia Saora practise polygyny for a family badly needs more women workers for *bagado chas* (shifting cultivation) and other economic activities, there are more married women (38.82%) than men (35.40%); more unmarried men (61.80%) than women (55.88%); very low incidence of divorce (0.60%); very low incidence of separation involving women only (0.30%); and more widows (4.12%) than widowers (2.18%).

The Total Literacy of the **Lanjia Saora** (30.66%) and their Female Literacy (17.35%) are low

The total population of 100 **Juang** study households is 529 comprising 280 males and 249 females showing the numerical superiority of males over females. The sex ratio is 889 females for 1000 males and the average household size is 5.3.

There are more married women (45.78%) than men (40%); more bachelors (55.71%) than spinsters (50.20%); very low incidence of divorce (0.75%); very low incidence of separation (0.75%) more in cases of women (1.20%); and more widowers (3.21%) than widows (2.81%).

The Total Literacy of the **Juang** is 34.59 percent and their Female Literacy is only 22.89 percent, which are little better than those of the Lanjia Saora.

Skills & Occupational Pattern; Continuity & Mobility

Deforestation has caused deterioration of natural environment as well as the traditional life support system of the Lanjia Saora and the Juang. Their dependence on traditional livelihood sectors such as, hunting, shifting cultivation, animal husbandry

supplementary income. The Juang have earned reputation for making beautiful wooden or bamboo combs and for woodcarving.

47 percent of the studied population of the Juang constitutes the Working Population.

Corresponding to the sex ratio and marital status, in the Working Population, men maintain superiority over women numerically, but percentage wise, it is the *vice versa*.

Their average engagement in major avocations such as, Terrace Cultivation, Shifting Cultivation, Wage earning and Forest Collection comes to less than half of a year. As such they remain under-employed, for the remaining part of the year.

Sector wise men spend the largest number of days in average in Settled Cultivation followed by, Toila Cultivation and Forest Collection and the minimum in Wage & Labour. For women it is the reverse. Thus forest based subsistence activities like Toila chas and Forestry, still remains their major subsistence activity in terms of the extent of engagement.

In terms of average engagement in these avocations men work little more than women in all sectors but Wage & Labour.

Agriculture

Agriculture is the mainstay of the economy of both the tribes. In recent times it has taken precedence over shifting cultivation – their traditional mode of subsistence, which no longer remained profitable under the cumulative impact of deforestation, ecological imbalance and decline of land/man ratio for pressure of growing population. Since cultivable land is in short supply in both the areas for undulating nature of the hilly terrain, the Lanjia Saora have been ingenious enough to find an answer to this problem by mastering the art of preparing and cultivating terraced paddy fields on the lower hill slopes and bottoms, which they call 'Saroba'. They exhibit a high degree of indigenous skill, ingenuity and technological outfit for preparing the terraces with inbuilt water management system. The Juang have not gone that far. They are developing and cultivating wet lands in hill bottoms, valleys and streambeds, which they call 'Beda' or 'Bila' to grow paddy.

Yet, both the tribes still have to continue with shifting cultivation to supplement their diet and earnings. Mainly they grow rice in their wetlands and a variety of minor millets, cereals, pulses, oilseeds and vegetables in the swiddens and the up

and dry land. Thus the Lanjia Saora possess three kinds of farmlands – (i) Saroba, (ii) Baseng and (iii) Bagado. The Juang have four kinds of farmlands – (i) Beda / Bila: (ii) Guda: the up and dry land, (iii) Toila / Kaman and (iv) Badi / Bakdi:. The Guda and Toila / Kaman are utilised for growing a variety of cereals, pulses, oilseeds and vegetables.

Cultivable Land Holding Pattern

Cultivable lands include all kinds of farmlands excluding the swiddens.

Among the 100 **Lanjia Saora** study households, only 3 (3%) are landless.

Small Farmers form the majority group (38.14 %) followed by that of Medium Farmers (23.71 %). The bulk (60 %) of the landowning households fall under Marginal and Small Farmers category. The average size of landholding per landowning household is 2.73 Acs

5 % of the **Juang** Study Households are landless.

Small Farmers form the majority group among all categories and the bulk of the landowning households fall under Marginal & Small Farmers category. The average size of landholding per landowning household is 2.39 Acs.

Trend of Agricultural Production

Their settled agricultural practices mainly revolve around their Saroba.

Saroba- the terraced paddy fields are their valuable productive assets. Almost all the study households (97%) possess Saroba in an average of 1.63 Acres per farmer household. Where adequate irrigation is available they raise a second paddy crop during summer months.

Baseng – the up and dry land is not as productive as the Saroba. Majority (91%) of the study households possess pieces of Basengs in an average of 1 acre per household, which, they utilize for mixed cropping like they do in their swiddens (Bagado).

A comparison of agricultural yield between the past (10 years ago) and the present shows that, average production per acre for all kinds of crops from Saroba and Baseng have declined by –12 percent during this time. The rate of decline for the paddy crop of the Saroba is –11.43 percent. For cereals, pulses and oilseeds grown in Baseng it is -13.21 percent, -15.29 percent and –20 (the highest among all) percent respectively. Thus yield from the Baseng, have declined more than that of Saroba.

Settled agricultural practices of the **Juang** mainly focus on their Beda or Bila, the wetlands for paddy cultivation which they regard to be their valuable productive asset. 83 percent of the study households possess Beda at an average of 0.95 Acres per farmer household. But they hardly raise a second paddy crop in Beda during summer months even though there are irrigation facilities. *Guda* – the up and dry land is not as productive as the Beda. Majority (95%) of the study households have *Guda* plots in an average of 1.56 acres per household, which they utilize for mixed cropping like they do in their swiddens (*Toila*).

The agricultural production of all categories of crops per acre have declined for both the categories of farmlands @ -20 percent over the decade. The quantum of production of paddy from the Beda has come down by -18.35 percent. In case of the *Guda*, the rate of decline is higher than Beda. Among the crops grown in *Guda* and Beda the rate of fall is the highest (-29.49 %) for the oil seeds.

People's Response on the Situation

The **Lanjia Saora** and **Juang** farmers generally know the reasons for decrease of their farm output. They mainly attribute the consequences to (i) Deterioration in the Quality of Soil, (ii) Uncertain Agro-Climatic Conditions manifested in erratic and inadequate rainfall. Since most of their farmlands lack assured irrigation facilities, they are bound to be dependent on the natural agro-climate to reap a good harvest.

One third of them know that destruction of natural vegetations and population rise lie at root of the present problems. Deterioration of the natural environment has become a matter of major concern for them. They apprehend that the situation is going to deteriorate further in future. Now agricultural yields do not sustain many of them for a full year. Therefore the Lanjia Saora have to take recourse to seasonal migratory labour.

Horticulture

Being trees lovers, the Lanjia Saora and the Juang take all care to preserve the fruit plants like date palm, mango, jackfruit, tamarind, Mohul, Salap, Ramphal, Sitaphal, *kendu* etc in their villages, hills and swiddens. Besides, they raise kitchen garden in their backyards and orchards in the close proximity of their houses.

Presently, following the diminishing returns from agriculture, shifting cultivation and forestry, the **Lanjia Saora** are looking for a dependable supplementary source in horticulture. The horticulture programme, introduced as an alternative to swidden cultivation, has become popular and they have started growing new horticultural crops introduced by themselves as well as the development agencies.

Now besides the development of kitchen gardens and backyard plantations, mixed orchards and commercial cash crops, cashew have been raised in wastelands and hill slopes covering parts of degraded swiddens. The cashew plantation drive has been very popular for its low maintenance and high profitability. Now, they are growing cashew on their own initiative and so, more than 80 percent of the families own cashew orchards from which comes a good part of their income. Helping them to enhance their level of income, it has emerged as a gainful pursuit, gradually pushing shifting cultivation to the back stage.

Among the 100 study households 96 have kitchen gardens, backyard plantations (Kandung Sing) at an average of 0.10 Acs per household and 83 have orchards (Kota), mostly including the cashew plantations at an average of 1.79 Acs per household.

The deleterious impact of deforestation is reflected in horticultural production in their backyards and kitchen gardens where they mostly raise conventional crops. The rate of decline over last 10-15 years has been -20.5% in terms of quantity; but the deficit is made up in value terms by newly introduced crops like cashew, zinger, pineapple, coconut, tomato, cauliflower, beans etc which fetch them a better price.

The new crops and especially the cashew have reversed the trend of negative growth rate in all other sectors of production and registered a notable rise of +14 % in case of the Orchards and +5 percent in total horticultural production nullifying the -20.5% decline in the yields of backyards and kitchen gardens between past and present.

Formerly, they were producing horticultural crops to meet their own consumption needs. After being aware of the better sale value of their fruits and vegetables, now they are raising modern HYV crops and selling these in the local weekly markets to buy their provisions with the sale proceeds. This trend has begun since 10-15 years.

The respondents said that the area under horticultural plantations has expanded in the mean time and more particularly for the popular acceptance of the cashew plantation.

Presently, the **Juang** are being motivated by the development agencies like the ITDA, DRDA and JDA to raise profitable horticultural crops to make up the deficit caused by the decline of forest based subsistence activities and supplement

their income. Now some of them have started growing many new varieties of horticultural crops including vegetables.

98 study households out of total 100, own horticultural plantations in shape of kitchen gardens and backyard plantations (Badi) at an average of 0.11 acres per household.

Under the impact of deforestation, their horticultural production has reduced by-22% Formerly they were producing their conventional horticultural crops in their *Badis* for their own consumption. After being motivated by the development agencies, now some Juang farmers have started raising modern HYV of fruits and vegetables.

Shifting Cultivation

Shifting cultivation is an archaic agricultural system in which forests are cleared by felling and subsequent burning and are cropped discontinuously by (i) rotation of plots (ii) employing family and cooperative labour as chief input, (iii) application of crude technology using simple implements such as hoe, digging stick, knife, axe, sickle etc, and not using draught animals and (v) leaving a fallow period larger than the period of cropping.

Mostly the forest-dwelling tribals, resort to this archaic mode of cultivation, where enough plain lands are not available for settled cultivation. The most remarkable feature of shifting cultivation is that though the yield is low, a variety of cereals, pulses, millets, oil seeds and vegetables are grown in one plot which is not feasible in the plain land cultivation. The existence of this primitive agriculture as a way of life since the hoary past is a proof of its deep impact on the tribals' psyche. It has undoubtedly evolved as a reflex to the physiographical character of their habitat on specific adaptation to forest and hilly environments.

So long as the land man ratio remained favourable, this practice did not pose so much of a problem. However, the growth of population and depletion of forests have disturbed the equilibrium. The reduction of fallow has led to soil erosion and deterioration and permanent damage to land, which again led to extension of its coverage to larger tracts of forestland. Studies made by T.H.R.T.I, show that this practice is uneconomic for high requirement of seed and labour and low returns.

Traditionally for the Lanjia Saora, and the Juang, swidden cultivation has been their way of life. With the degradation of forest, swidden cultivation does remain

profitable. Now the Saora and the Juang are realizing that this age-old mode of subsistence would no longer sustain their growing population. While trying to reduce their dependence on this less gainful venture and looking for alternatives, they are yet to abandon the practice altogether.

Normally a **Saora** cultivates a *bagado* plot for three consecutive years and leaves it fallow for 8-12 years for rejuvenation. The more the regenerative fallow period, the better is the fertility and productivity. Now these conditions are deteriorating day by day.

- There is gradual reduction in the cultivated area and the number of farmers from the 1st year *(amengal)* to the 2nd and 3rd year *(asinal)* of *bagado chas*.
- Over a period of 10-15 years, the over all quantum of production has decreased by 31 percent, the rate of decline being the maximum (-32.15 %) in the 1st year followed by those in the 3rd year (-29.89 %)and then in the 2nd year (-26.42 %).
- Among different categories of crops the rate of decline of yield is the highest (-42.86 %) for spices like Turmeric, Ginger, Chilies etc. followed by pulses (-35.90 %), oilseeds (-33.33 %), cereals (-30.71 %) and the lowest being the vegetables (-21.05 %).
- Spices, cereals and pulses are the worst affected crops during all the three-year cycle.
- For spices, pulses, and vegetables the highest decline is seen in the 3rd year *bagado*.
- For declining fertility of *bagado*, cultivation of a variety of crops has been stopped.

The largest number of *bagado* cultivators (62%) knows that the yield is reducing with the decline of soil fertility. 50 percent of them attribute this to uncertain agro-climate with inadequate and irregular rainfall; 48 %, to soil erosion and 42%, to shorter fallow period.

The fallow period varies with the subsistence need of the farmer as it determines the extent of his dependency on *bagado chas*, be it profitable or not. A poor farmer with limited means of livelihood has to exploit whatever *bagado* he possesses more frequently than a well-to-do farmer. In the past the fallow period

for poor Saora farmers were 5-8 years and for the well to do it was 7-12 years as the land man ratio was better. Now, the fallow period has been coming down to 3-5 years and 5-8 years respectively for both the categories of farmers.

Many hill slopes are now degraded for continuous exploitation and become unfit for *bagado chas*. These are coming under the popular progamme of cashew plantation. The people are aware of the fact that the deteriorating ecological conditions would hardy sustain their traditional *bagado chas* but the poorer among them have little choice.

The study data clearly depicts the declining trend of **Juang's** traditional mode of subsistence locally called *toila chas*. Normally a *toila* plot is cultivated for 2-3 consecutive years and left fallow for 5-8 years for regeneration. For first year cultivation the plot is called *Toila* in which only pulses, oilseeds and vegetables are cultivated. In the 2nd year's plot called *Ekan* only cereals, spices and vegetables are cultivated. As its fertility decreases gradually for erosion of topsoil and its nutrients, the cultivation area between the 1st and 2nd year decreases and so also the number of cultivator families. In exceptional cases, if the land retains some fertility it can be cultivated in the 3rd year (*Nala* to grow paddy and vegetables. The fertility depends on the soil quality, agro-climate and the regenerative fallow period. Now these conditions are worsening day by day.

- There is gradual reduction in the cultivated area and the number of farmers from the 1st year *(toila)* to the 2nd year *(ekan) Toila chas*.
- Over a period of 10-15 years, the over all quantum of production has decreased by -32.40 percent, the rate of decline being the maximum (-35.96%) in the 2nd year.
- The negative growth rate of yield is the highest (-36.19%) in case of Cereals closely followed by spices (-35.18%) like Turmeric, Ginger, Chilies etc. the vegetables (-30.50%), the pulses (-26.97%), and the lowest being oilseeds (-24.74%)
- The highest rate of decline of yield is noticed in the 1st Year *Toila* (-30.14%) and 2nd year *Ekan* (-43.46%) for spices. It shows that spices, vegetables and cereals are the worst affected crops during all the two-year cycle of *Toila chas*.
- For declining fertility of *Toila*, cultivation of certain variety of crops has been stopped

The majority of Juang shifting cultivators (52%) knows that the yield from their *Toila chas* is declining with the decline of soil fertility. 40 percent of them attribute this to soil erosion; 35 percent, to uncertain agro-climate with inadequate and irregular rainfall; and 33 percent, to shorter fallow period.

In the past the fallow period for poor Juang farmers were 5-10 years and for the well to do it was 9-12 years and then the 3rd year cultivation *(Nala)* of cereal crops could be possible Now, the fallow period has been coming down to 4-7 years and 6-9 years for both the categories of farmers and the *Toila* land cannot be exploited for more than two years.

Some of the hill slopes are now degraded for continuous exploitation and turned unfit for *Toila chas*. However, the people are left with little choice.

Firewood Collection

The Lanjia Saora and the Juang generally collect firewood from their swiddens and surroundings for their own consumption. In the past when vegetations existed almost in their backyards they were gathering fuel for their kitchen within a radius of 1-2 kms. As the vegetations are vanishing, this distance has increased to 2-3 kms for the people of the study villages. Obviously this distance increases further in the summer months.

- Both the sexes shoulder the burden of firewood collection almost equally with small seasonal variations.
- For processing the firewood i.e., chopping, splitting and slicing the stock in order to make it ready for use, among the Lanjia Saora men are more engaged than women in all seasons while among the Juangs women work little more than men for collection and for processing it is the *vice versa*.
- With depletion of the vegetations, within last 10 - 15 years, the quantity of household annual collections and domestic consumption has come down by -21 percent and - 20 percent respectively in case of the Lanjia Saora. For the Juang it has been -24 percent and -17.13 percent respectively.
- Any shortage in firewood is substituted by farm refuses e.g., crop residues, dry leaves etc.
- It is evident from the above data that after meting their domestic consumption needs, particularly the Juang sale the surplus. Following the declining trend

this surplus saleable quantity has also come down by –22 percent affecting their family income.

- Both the tribes are aware of the demand-supply gap, which may turn acute in future. They also understand that with the receding tree line and growing population the firewood is going to be scarce in future. Their womenfolk who have to keep their hearths burning are more alarmed than their men about the impending crisis.

Collection of MFP

The consumption pattern of tribals, indicate that the MFP items constitute important source of sustenance for at least three lean months in a year.. The MFP provide raw material for their cottage industries. During drought and adverse climatic condition, their dependence on MFP increases. In the area where job opportunities and viable economic alternatives are few, this dependence is significant.

As forest dwellers the Lanjia Saoras and the Juang derive a part of their subsistence out of forest-based activities. They collect an endless variety of seasonal minor forest produce like small timber, bamboo, thatching grass, fodder, fruits, roots, seeds, tubers, mushrooms, leaves, flowers, fibers, leaves, barks, herbs, etc mostly, to meet their consumption needs. Only a few surplus items are sold out after meeting their domestic requirements.

Deforestation is directly linked with reduced availability of MFP, additional workload and greater hardship, as the forest dwellers require more human power to collect even the minimum required for survival.

The distance to the source i.e., the forest has increased in the mean time for all items. That brings about the hardship to cover larger distance and spend more time in this activity. As the **Lanjia Saora** women shoulder the burden of collecting the MFPs more than men. Therefore they face the hardships more due to deforestation. They have to walk and work for an additional 3 to 4 hours a day to collect MFP and also work at home in order to survive.

Collection and processing of MFP keeps the **Lanjia Saora** engaged for almost two and half months in a year. Sex wise the women are little more engaged i.e., average 73 man-days in a year than men whose average engagement in this trade is 69 man-days.

The reduction in the supply of MFP between past and present is visible in all categories. The highest decline is in gums (-50 %), followed by broomsticks (-42 %), seeds, fruits and leaves (-39 % in each case), and the lowest, being in flowers (- 12 %). For other categories the rate of decline ranges between 16—36 percent. As a result their average household consumption of all these items have come down by 9—50 percent and created deficits by imbalancing the equation of demand and supply.

The distance between the **Juang** MFP collectors and the forest has increased from 0.5 — 3.8 kms to 1.5 — 5.8 kms between past 10-15 years and the present for all items. That brings about the hardship to cover larger distance and spend more time in this activity.

Juang men and women shoulder the responsibility of collecting the MFPs almost equally. In average, they work for about 78 days each in a year for this activity. But Juang women face the hardship more than men because with the forests receding far and natural resources dwindling, they have to walk and work for an additional 3 to 4 hours a day to collect MFP in addition to attending the household works.

The reduction in the procurement of MFP between past and present is visible in all categories- the overall decline being –30.77 percent. The highest decline is in small timber (-44.4 %), followed by resin (- 40 %) and the lowest, being in grass (-18.7%). The rate of decline ranges between -30 percent and -35 percent for items like Broomsticks, Fodder, Fruits, Leaves, Lac and Mushrooms. It is between -23 and -29 percent for items like Barks, Bamboo, Roots & Tubers, Flowers, Plants & Creepers, Seeds and Gums and Herbs. As a result their average household consumption of all these items have come down proportionately by -34 percent to -8 percent and created deficits by unbalancing the equation of demand and supply. Likewise their volume of sale of the surplus MFP have shrunk from -66 percent to -14 percent for different categories causing economic hardship to them.

Most of the **Lanjia Saora** and **Juang** respondents feel that the problem is caused by deforestation and the consequent lack of access to MFP. The first indication is the difference between the past and the present in the collection, consumption and sale of MFP. This is attributable primarily, if not exclusively, to the difference in the forest area available and the consequent difference in access to the dwindling resources. The data seem to endorse this.

Possession of Livestock

The Lanjia Saora and Juang rear animals for their agricultural, ritual and consumption purposes. With depletion of natural vegetations and decline in agricultural production, they now face problems to feed and maintain their livestock.

- Among the **Lanjia Saora**, the animal population has decreased significantly (- 40%) - the average livestock per household shrinking from 14 to 8 animals over 10 –15 years
- The highest negative growth rate (-78.13 %) is recorded in case of pigs followed by buffaloes (-47.83 %) and cows (-45.51 %), the lowest (-23.64 %) being the bullocks.
- The largest number (71.35 %) of respondents cited about shrinking of grazing sources along with drying up of water sources and shortage of fodder caused by deforestation. Particularly, these factors have affected the populations of buffaloes, cows and goats.
- Pig rearing that has been quite common in the past has suffered a major set back on the advent of Christianity. Christianized Saoras are tabooed against this practice. Some village councils have restricted goat rearing in order to protect the horticultural plantations, which have started in a big way over past decades.
- Among the **Juang**, the animal population has decreased by -35.62 percent with the average livestock per household shrinking from 12 to 8 animals over last 10 –15 years.
- The highest negative growth rate (-59.46 %) is recorded in case of pigs followed by buffaloes (-56.76 %) and bullocks (- 45.73 %), the lowest (-23.53 %) being the goats.
- Majority of respondents (87.50 %) cited about social taboos and prohibition against rearing pigs as a social mobility tactic.
- 72 percent of the respondents attribute this decline to shrinking of grazing sources and 62 percent. to drying up of water sources. Particularly, the populations of buffaloes and bullocks have been affected by these factors.
- Goat rearing- the traditional gainful economic pursuit has been affected for shrinkage of grazing sources and shortage of manpower for tending the stock

as now the Juang children who generally are engaged for this work are being persuaded to go to schools

Indebtedness & Bondage

The deficit in the household budget caused by decline of traditional forest based subsistence activities on account of deforestation drives the gullible tribals into the vicious circle of indebtedness and bondage from which he cannot get out very easily. He and his children live in debt and die in debt. Indebtedness in most cases leads to bondage and land alienation. The worst victims are the poorer and landless sections who have no other options.

This situation was prevailing in the study areas till the recent past. But now, thanks to the tribal and rural development programmes, the circumstances have changed. Nationalised Banks and Self Help Groups (SHGs) have come to their rescue overshadowing the unscrupulous private moneylenders and eliminating the chains of bondage out of indebtedness. Yet in the Juang area the dishonest private lenders are still there. It is not easy to neutralize their ageold spell on the vulnerable Juangs. The silver lining is that the level of awareness of the people is increasing.

Now, Indian Bank, State Bank of India and SHGs have advanced substantially larger amounts of loans to the **Lanjia Saora** than the private lenders. The position of repayment of loans by the loanees is also good i.e., 58. 42 percent. This has curtailed the jurisdiction of the latter over the needy people. As a result there is not a single case of bondage and alienation of any valuable economic asset to the private financiers on account of indebtedness.

In case of the **Juang**, the District Rural Bank i.e. Boitarani Gramya Bank has advanced fairly larger amounts of loans to the people than the local moneylenders. The position of repayment of loans by the loanees is not so good i.e., 36.6 percent only. Large inflow of institutional finance has pushed the greedy private financers to the backstage, removing their grip over the vulnerable sections. But the application of the concept of Micro Credit through Self Help Groups has yet to make any impact on the Juang economy.

Household Income

Between past and present, the average annual income of the **Lanjia Saora** study households rose by 45.78 %, while the expenditure increased by 47.55% inflating the deficit in household budget.

The highest component of income i.e., (29.84 % in the past and 28.89 % in the present) comes from settled agriculture. Yet there is one percent fall between then and now for decline of productivity.

The second highest income is reported from horticulture. While the income from the backyards & kitchen garden sub-sector has decreased marginally from 6.05 percent to 5.48 percent, that from other horticultural plantations like mixed orchards and cashew plantations etc. have increased significantly from 13.02 to 17. 74 percent. Thus, the total contribution of horticulture sector to household income has risen from 19.07 to 23.22 percent negating the trend of decline in other sectors. This is happening for the popularity of modern horticultural programmes in general and the spread of cashew plantations in particular.

Forest collections that constituted the third largest source of household income (14.82%) in the past have fallen down to the 5th position (10.93 %) at present for gradual depletion of this age-old perennial source. It has come below that of wage and labour (15.16 %) and service (12.40%), which were in the 5th and 6th position in the past. That means following the decline of forest resources, people are looking for alternatives in other avenues like wage earning to supplement their income and make up the deficit.

Like forest collections another important age-old forest based source of subsistence i.e., the shifting cultivation has been declining. Its contribution to household income has come down from 11.46% to 6.19% over the decade downgrading its rank from 4th to 6th.

Moreover deforestation and the ban on hunting have affected the incomes from allied sectors like animal husbandry, hunting and rural industry that is largely dependent on forestry.

Thus it is found that the earnings from large number of sectors i.e., 7 out of total 12, has declined over the decade. Sectors like shifting cultivation, animal husbandry, forest collections, hunting and fishing have shown major decline and the remaining 2 i.e., agriculture and rural industry have shown marginal decline. Conversely, there is significant growth of income from sectors like horticulture, wage earning and service.

Between past and present, the average income of **Juang** Households rose by 39.18 %.

The highest part of the income (40.51% in the past and 43.11 % in the present) comes from settled agriculture. This marginal rise may be attributed to the Juang farmers' increased dependence on this sector and popular acceptance of agricultural development schemes following decline of incomes from traditional forest based sectors.

The second highest income is reported in the past from Forest Collection (23.36 %) and in the present from Service (18.76%). With gradual depletion of forest resources income from Forest Collection has been reducing day by day downgrading its position to the 3rd.

Income from shifting cultivation-their age-old forest based source of subsistence has also come down from 13.21% to 7.57 % over the decade downgrading its rank from 3rd to 4th.

Following the decline of forest resources, people are looking for alternatives in other avenues like Wage Earning, Service, Trade & Barter to supplement their income and make up the deficit. Yet due to availability of limited avenues for wage labour the share of earnings from this sector has remained the same but its position has declined from 4th to 5th.

The income from backyards & kitchen garden sector have decreased from 6.60 percent to 3.68 percent reducing its position from 5th to 6th and indicating indifference of the Juang farmers towards horticulture development schemes.

Moreover, deforestation and the ban on hunting have affected the incomes from allied sectors like animal husbandry, hunting and rural industry that is largely dependent on forest resources. In case of hunting the income has reduced to one third making it a mere ritual activity and for animal husbandry the rate of decline is about 50 percent.

Thus it is found that the shares of earning from large number of sectors i.e., 8 out of total 12 have declined over past 10-15 years. Sectors like shifting cultivation, horticulture, animal husbandry, rural industry, hunting and fishing have registered major decline – ie 50 percent more or less and that out of the remaining 2, wage earning has shown marginal decline and forest collections, a moderate decline of about 30 percent. Conversely, there is significant growth of income from sectors like service (lifting its position from 7th to 2nd) and gift & exchange and marginal growth, from agriculture and trade and barter.

Household Expenditure

The quantum of average annual expenditure of the **Lanjia Saora** study households has increased on all the 18 heads.

Among all the heads the highest average household expenditure has been made on fooding and the second highest, on house construction and maintenance. Both have maintained their 1st and 2nd positions in the past and the present. A decade ago the total share of both the heads was 54.27 %. Now this has marginally increased to 57.53 percent.

The expenditure on payment of land revenue has been the lowest among all the heads. Consistently, it has held the lowest i.e., the 18th rank then and now.

Expenses on agriculture, shifting cultivation and horticulture has come down in percentage terms i.e., from 7.1 %, 7.25 % and 7.25 % in the past to 5.69 %, 5.32 % and 4.12 % respectively in the present. While agriculture and horticulture have retained their 4th and 7th ranks respectively, shifting cultivation had stepped down from its former 3rd to 5th rank indicating its decline from the position of a major traditional subsistence activity.

The other heads, which have held their ranks consistently, are dress & ornaments (6th), rituals & festivals (8th), education (10th), treatment of diseases (12th) and rural industry (17th). However in percentage terms, their share has changed nominally both on the positive and negative sides except that of rural industry, which has remained constant at 0.19 percent.

Presently, the people are not only spending more on construction and improvement of their houses, they have also raised their expenditure for acquiring modern and durable assets. This has caused the upgradation of rank of the head for purchase of durable assets from 11th to 9th while its share has increased significantly from 1.95 percent to 3.17 percent.

The data establishes a trend; the pattern of household expenditure of the Lanjia Saora has not changed much over the past decade. Yet signs of modernization are visible in increased spending on house construction and maintenance, acquisition of durable household assets, treatment of diseases, gift and exchange, education and training and fooding.

The data on average annual expenditure of the **Juang** study households shows that the quantum of expenditure has increased by 32 percent between then and now.

Among all the heads the highest expenditure has been made on fooding and the second highest on, house construction and maintenance and as such both have maintained their 1st and 2nd positions not only in the past but also in the present circumstances. A decade ago the total share of expenditure on both the heads accounted for 57.06 percent of the total. This has reduced to 52.75 percent at present.

The expenditure has been the lowest on payment of land revenue in the past and on rural industry in the present. Their positions have been interchanged between 17th and 18th during this period.

Expenses on majority of heads i.e., 12 out of 18 such as, Shifting Cultivation, Horticulture, Rural Industry, Dress & Ornaments, Rituals & Festivals, Entertainment of Guests, Treatment of Diseases, Education & Training, Construction & Repair of House, Litigation, Fuel & Fodder and Fooding has come down in percentage terms.

The share of expenditure has gone up significantly on Loan Repayment and Purchase of Durable Assets upgrading their ranks from 14th to 9th and 10th to 5th respectively. It indicates peoples' interest towards modern way of life. Marginal increase is noticed in the remaining 4 heads such as Agriculture, Drinks & Intoxicants, Land Revenue and Gift & Exchange.

Besides Fooding and House Construction, the only other head, which has held its rank at the 16th place consistently over period of time, is Litigation. However in percentage terms its share has come down from 0.26 % to 0.10 %.

The expenditure pattern of the Juang study households has shown some changes over period of time. Trends of modernization are visible, in expenditure hike in acquisition of durable household assets, agriculture, gift and exchange and loan repayment. For agriculture and debt redemption, the reason lies in acceptance of modern development schemes and liberal debt financing by local rural bank. Since some of the families have been allotted Indira Awas Houses, the overall spending on house construction and maintenance has not increased much.

The annual income and expenditure data of the study households is indicative of the fact that all of them are Below the Poverty Line (BPL).

To sum up, the situation of deforestation for the tribes under study looks bad but not worse as it has been in certain other pockets. Yet it raises concern because in course of time, consequent upon deforestation, they are gradually getting

marginalized and alienated and so, there has been a change in the economy of the tribe and in their attitude towards forest. There has been very little effort to orient the development programmes and forest management in harmony with their needs, problems and livelihood issues.

However, there are rays of hope for the **Lanjia Saora**. Being the industrious, innovative and enterprising folks, they are trying hard to find alternatives in terrace cultivation, horticulture and seasonal migratory labour, by acquiring new ideas and modern skills while reducing their traditional dependence on forest based subsistence activities like shifting cultivation and forestry. Experiencing the environmental hazards of deforestation on their livelihood and culture, they have realized the indispensability of restoration of the degraded natural environment around their habitat for which they are willing to contribute their part actively by planting commercial as well as traditional species in their surroundings and degraded swiddens. They need to be assisted.

The situation is not the same in the Juang area. They are slow in accepting new ideas and the development inputs. However they understand quite well that forest resources are limited and they shall be the worst sufferer if forests are destroyed by greedy and irresponsible human beings. But they are yet to find any dependable alternative.

It is a sorry state of affairs that the receding forest line is not a good sign for sustainable development of forest and tribals like the Juang.

Changu Dance of Juang

Juang Girls making preparation for festival

Typical Juang Settlement

Fire wood for kitchen

Sharing of food pot by Juang children

Preparation of leaf plates

Paddy cultivation in Beda Land

Raising crops in Swiddens (Taila)

GRAMSIRI - The Village Deity of Juang

Making of a wooden plough

MAT MAKING BY JUANG WOMAN

WEEKLY MARKET IN JUANG AREA: GONASIKA

CONCLUSION

The forests are getting depleted under the pressure of heavy demand made by population growth, housing, trade and industry. Deforestation has been instrumental in destruction of rich flora and fauna, which sustained the tribal population for ages. This has caused environmental hazards in shapes of irregular, uncertain and insufficient rainfall, degradation and erosion of fertile top soil leading to diminishing farm production and often, crop failure; draught; scarcity of food, fodder, firewood, timber, MFP and water etc,; atmospheric warming; flood for silting of rivers and reservoirs and pushing the wildlife to the edge of extinction. Hence, there emerges an urgent need to restore an optimal vegetal cover to balance the disturbed eco-system.

To the forest dependent tribals, the forest has not been a source of profit but of survival. Therefore, deforestation involved the deprival of their life support system around which they had built their socio-cultural, economic and religious life. For them it is not merely the deprival of MFP but a crisis in their life. Economically, it involved scarcity of food, fuel, fodder, medicinal herbs and small timber on which they depended for ages.

Coming to the consequences of deforestation on the tribe under study, one can find the situation deteriorating but it is not so bad as it is seen in certain other areas. The people seem to be aware of the malady and the Lanjia Saora are experimenting with possible alternatives employing the skills and resources at their command, as mentioned previously. Yet it raises concern in the context of macro and micro level issues of environmental degradation, ecological imbalances, the peoples' livelihood and culture.

In the past, not finding enough cultivable plain lands in their remote mountainous habitat the Lanjia Saora and the Juang resorted to exploitation of available resources through forestry and shifting cultivation. As population rose, vested interests entered the scene for commercial interests and forests started receding, the helpless tribals were left with no choice except to overexploit the resources that were left in their hands. As a result, the shifting cultivation cycle came down to six or even three years, thus aggravating the situation of environmental degradation and human impoverishment.

Slowly and gradually, the crisis is affecting their culture. From a culture of a mutually supportive community they have begun to drift towards individualism. Traditionally, land and forest ownership was community based, i.e. either the whole community owned it and distributed the resources among the individual families taking into account their need and capacity to exploit the share. With the arrival of the external agencies, individualism and the written document based ownership was introduced. While a few among them absorbed this culture, the rest struggled to cope up with the formal system and the monetised economy.

The transition from an informal to a formal economy has started. Since the past century, planned change and modernization have effected a conflict between their informal and the formal system in which the forests and other natural resources are public properties as source of raw materials meant for profit only. To the tribal communities, forests and other natural resources are community assets, meant to be used sparingly for meeting the basic needs and to be preserved as a perennial and renewable life support system. The cardinal rule in this system is mutual cooperation and not competition as in the formal system of a capitalist economy that is being encouraged in the name of planned development.

In this conflict between the powerful formal and the powerless informal system, the latter becomes the underdog. The solution lies in undoing these causes. To do that the starting point would be the attempt to re-establish the weakened traditional link between the forest and the forest dwellers who have traditionally preserved it. They should be made to revive their vested interest in environmental conservation. They will be the only partners to conserve the natural resources and regenerate the destroyed biomass.

To check the menace of deforestation and revive the natural environment, an intensive and extensive programme of afforestation, reforestation and biomass regeneration is to be implemented through active participation of tribals. The programme should provide maximum income generating opportunities for them. It can help in bringing them back to constructive dependence on the natural resources.

In this connection, forests should not be viewed only as trees, but as an integral part of a total system that meets the needs of the people, environment, industry and revenue earnings of the state. The regeneration of forests, should therefore not only mean the planting of trees but also the restoration of the whole ecological system to meet the people's needs. This calls for a fresh look into the **forestland**

ownership pattern, in the arena of planning and implementation of afforestation and reforestation programmes, priorities of forest development and conservation policies, the choice of species, and the beneficiaries.

Unless the consumption needs of the tribal people for, fire-wood, fibre, timber, medicines, food and fodder etc are met by plantation of appropriate forest species, they will have no alternative but to exploit the valuable species for their requirement. Therefore priority is to be given to **community forestry** and to grow the type of plant species that will cater to their food, fuel, fodder, small timber and other needs.

If the people do not get the minimum **grazing lands** required for their cattle, what remains is bound to be overexploited. Then its value diminishes, fertility declines, and it turns into a wasteland. This again raises the important issue of the **forest land-use pattern.**

The **Dhebar Commission** (1961) recommended that, subject to safeguards, tribals should be allowed to cultivate forestlands, their needs should be met from outlying areas in the reserve forests and their requirements for grazing and shifting cultivation should be conceded. The **National Commission on Agriculture** (1976) too advocated for inter-relationship between forest economy and the tribal and rural economy.

Customary community rights on forestland should be recognized and their indigenous knowledge and skills be adapted to serve the urgent needs of the soil and water management and re-afforestation of denuded tracts by suitable species.

They should be given heritable and inalienable right over the land that they cultivate.

Deforestation must be strictly banned in the area vulnerable to soil erosion.

Though the subject of forests in general transcends the limited scope of tribals and forestry, it cannot be denied that tribal life is profoundly affected by whatever happens to forest. Hence, forest development cannot make much headway without involvement of tribals.

Shifting cultivation is bound to continue till the landless and deprived sections are given a dependable alternative. The problem has social and cultural overtones. Therefore, motivational approach through introduction of alternative livelihood programmes is required. Integrated programmes of forestry suitably

harmonized with scientific land use practices should form the backbone of such strategy.

The People are to be helped more in their innovative initiative for development of valley lands and construction of terraces for settled cultivation with provision of irrigation wherever feasible, horticultural plantations in moderate and degraded slopes and forestry plantations on hilltops. Animal husbandry should be promoted as subsidiary occupations.

Lands set free from shifting cultivation should be put under alternative use without any delay to prevent its reversion to shifting cultivation.

The symbiosis between the tribal community and the **forest management** should be restored by integration of tribal and forest economics and through imaginative forestry programmes and conservation and reorganization of traditional skills of the tribals.

The transformation from conservation to development forestry should be introduced through community forestry. Forestry activities should be carried out by many local people's institutions, rather than by a single forest department. In other words, meta-management system should be applied rather than super-management.

The management of forest areas surrounding the tribal settlements should be transferred to the concerned village communities through cooperatives, SHGs or for that matter, the Gram Panchayat/ Gram Sabha / Pali Sabha for plantation, maintenance, preservation, protection, and exploitation of MFP which meet their domestic, occupational and social needs. A permanent solution can evolve only if the whole community is involved in it and develops a vested interest in it.

Tribals should be made to play a more constructive role in forestry. They should be employed in forest service at different levels with proper training.

Forest management practices need to be modulated to be able to generate employment all the year round for prevention of migration and for sustained supply of raw materials for the requirements of agriculture and industry.

Tribals should be associated in large-scale plantation programmes giving them usufructory rights.

Ownership right on the trees growing in the holding allotted to a tribal in a forest village should vest in him.

The existing laws and procedures should be simplified for the tribals to understand them.

In the consumption pattern of tribals, the **MFP** constitutes a very important source of sustenance. In the area where job opportunities are few and viable economic alternatives, all but non-existent, this dependence is significant. Keeping this in view, their traditional right on exploitation of MFP should be protected.

Fortunately with the enactment of the PESA since 1997 in the Scheduled Areas of Odisha, the management and control of procurement, processing and sale of MFP items has been given to the Gram Panchayats. Our experience shows that the target people and their Panchayat representatives are hardly aware of this provision. Hence, awareness camps need to be organized at the ground level and the Panchayatraj institutions, SHGs, be mobilized to take charge to ensure that their people get a remunerative price for their produce and finished products and the unscrupulous traders and middlemen who exploit the tribals, are eliminated from the scene.

Tremendous employment potential can be generated and definite impact on tribal economy can be made through special drive launched for maximizing collection and utilization of MFP by formulating item wise location specific projects.

Rural industries involving use of MFP such as oilseeds, fruits, roots, seeds, leaves, flowers, barks, fibers, etc. and farm produce should be promoted on, priority basis, by tribal co-operatives, SHGs and entrepreneurs. It will help to improve the social and economic status of the tribal families. Necessary financial, technical, extension and marketing support should be provided to such enterprises.

Panchayatraj Institutions, Voluntary Organizations, Youth Clubs and Women's Cooperatives, should be supported to organise extensive environmental awareness campaigns to ensure increasing participation of tribals in afforestation, forest and wild life conservation etc. They should help in implementing alternative income generating programmes for tribal families to enable them overcome their basic livelihood problems. Emphasis should be laid on increasing earning capacity of tribal families through promotion of appropriate schemes by making use of local raw materials, skills and resources.

Tribal Women have suffered more than men due to deforestation. Hence, it is essential to promote participation of tribal women in all stages of forest development and management. They should be involved in the decision-making concerning forestry.

A **rational forest policy** has to show the utmost **concern for the eco-system** keeping in view the inextricable economic relationship between the forest and the tribals. The forests should be managed primarily by the forest dwellers and backed by technical guidance of the Forest Department and other technical departments.

Considering the need of the time, present as well as future, the interface of forestry with development has to undergo metamorphosis. In the emerging scenario the conservation orientation has to yield ground to development orientation and community forestry have to be accorded a fairly high priority.

Forests belonged to tribals in the distant past and as such they have developed a sense of belongingness to forests. With appropriate reorientation, they can be inducted into a more constructive role vis-à-vis the forest and relied upon for its conservation and growth. By building a sound rapport between foresters and tribals the task of conservation, protection and development of forests will be easier. In fact, the forest should be regarded as truly public resource and not as a mere revenue earner for the state.

REFERENCES

Banerjee, N.K.	(1972)	*An Appraisal of Shifting Cultivation in India: Agro Economic Problems of Tribal India"*, Ed. M.L. Patel, Bhopal (cited by N. Gopala Rao in Impact of Horticulture Programmes on Shifting Cultivators in Andhra Pradesh, Andhra University, Waltair, p.1, 1989, Unpublished Report).
Behura, N.K.	(1990)	*Shifting Cultivation- A cause of environmental degradation.* ADIBASI, Vol. XXX, No.4, pp.1-7.
Chandrasekharan, K.S.	(1983)	*Forest Policy and Tribal Development.* ADIBASI, Vol. XXII, No.3, pp. 16-31.
Debi, K.B.	(1990)	'Juang', Tribes of Odisha, THRTI, Bhubaneswar, pp.126-131.
Fernades, W & G. Menon, P. Viegas.	(1988)	*Forests, Environment and Tribal Economy,* New Delhi, Indian Social Institute.
Govt of India	(1960)	Report of the Scheduled Areas and Scheduled Tribes Commission, Vol..I, pp. 145.
Mohanti, K.K. (ed)	(2005)	development Hand Book for the Juang of JDA area, Gonasika, SCSTRTI, Bhubaneswar.
Mohapatra K. and K.B. Debi	(1973)	*Shifting Cultivation in Odisha.* ADIBASI, Vol. XIV, No.4, pp. 11-28.
Nayak, P.K.	(1992)	*Micro-Perspective of the Changing Frontiers of Forest Dependent Economy: The Saora Experience,* ADIVASI, Vol. XXII, No.2, pp. 35-43.
Patnaik, N.	(1989)	'The Juang', Popular Series on Tribes, THRTI, Bhubaneswar.
Rout, S.P.	(1962)	Hand Book on the Juang. Adibasi, Vol.XI, No.1-2.
Roy Burman, B.K.	(1982)	*Report of the Committee on Forests and Tribals in India*
	(1988)	*Shifting Cultivation: A Closer Look,* New Delhi: IASSI (Unpublished) (Quoted by Behura, 1990:3).

SCSTRTI (2002) Baseline Survey & Needs Assessment & Action Plan for the 10th Five-Year Plan for LSDA, Puttasing, (Unpublished)

(2002) Baseline Survey & Needs Assessment & Action Plan for the 10th Five-Year Plan for JDA, Gonasika, (Unpublished)

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