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Bauxite Mining in Eastern Ghats: Mapping the Livelihoods of Affected Communities

Prajna Paramita Mishra
M. Gopinath Reddy



RESEARCH UNIT FOR LIVELIHOODS AND NATURAL RESOURCES

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Foreword

The Centre for Economic and Social Studies (CESS) was established as an autonomous research centre in 1980. Conducting interdisciplinary research in analytical and applied areas of social science, encompassing socio-economic and other aspects of development, constitute the predominant activities of the centre. The Centre's research has developed expertise on themes such as rural development and poverty, agriculture and food security, irrigation and water management, public finance, demography, health, environment and other studies. Its sphere of research activities has expanded beyond the state of Andhra Pradesh, covering other areas of the country. The Centre has made important contributions to research in these areas.

Dissemination of research findings to fellow researchers and policy thinkers is an important dimension of policy relevant research which directly or indirectly contributes to policy formulation and evaluation. CESS has published several books, journal articles, working papers and monographs over the years. The monographs are basically research studies and project reports prepared at the Centre. They provide an opportunity for CESS faculty, visiting scholars and students to disseminate their research findings in an elaborate form.

The CESS has established the Research Unit for Livelihoods and Natural Resources (RULNR) in the year 2008 with financial support of Jamsetji Tata Trust. The core objectives of the RULNR are to conduct theoretical and applied research on policy relevant issues on human livelihoods and natural resource management, especially in areas related to river basins, forest and dryland ecosystems and to provide an effective platform for debates on policy relevant aspects for academicians, policy makers, civil society organizations and development practitioners. RULNR intends to adopt a multi-disciplinary approach drawing on various disciplines such as ecology, economics, social anthropology, political science.

This RULNR-CESS monograph titled "Bauxite Mining in Eastern Ghats: Mapping the Livelihoods of Affected Communities" by Prajna Paramita Mishra and M. Gopinath Reddy is an attempt to map the existing livelihoods pattern of affected communities in the mining areas. It assesses the exact costs and benefits of the mining projects and tries to understand the Resettlement and Rehabilitation (R and R) packages. The help of Samata, a social justice organization in Visakhapatnam is gratefully acknowledged in the fieldwork of this study.

This study shows that all project affected people do not have a sustainable livelihood. They are trying best to make a living out of their agricultural land and forest. Once mining or a refinery starts, they will be deprived of these assets. The authors find that the compensation money paid is not good enough for an alternative sustainable living and that the affected households do not spend the money received on developing an alternate livelihoods strategy. Developing such an alternative would be critical in resolving the development-environment conflict.

I hope that this monograph will be useful for academicians, policy makers and development practitioners as an assessment of the existing livelihood opportunities of people in the upcoming bauxite mining areas.

Manoj Panda
Director, CESS

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**Prajna Paramita Mishra
M. Gopinath Reddy**

ABBREVIATIONS

AAL	Anrak Alumina Limited
AP	Andhra Pradesh
APIDC	Andhra Pradesh Industrial Development Corporation
APMDC	Andhra Pradesh Mineral Development Corporation
BC	Backward Caste
CCF	Chief Conservator of Forests
CCLA	Chief Commissioner of Land Administration
CM	Chief Minister
CPR	Common Property Resources
CSE	Centre for Science and Environment
DFID	Department for International Development
DPs	Displaced Persons
DWCRA	Development of Women and Children in Rural Area
EIA	Environmental Impact Assessment
EPTRI	Environment Protection Training and Research Institute
GoAP	Government of Andhra Pradesh
GoRAK	Government of Ras Al Khaimah
GSI	Geological Survey of India
ICDS	Integrated Child Development Services
ICFRE	Indian Council of Forestry Research and Education
JSWAL	Jindal South West Aluminium Limited
JSWHL	Jindal South West Holding Limited
LTR	Land Transfer Regulation
MECON	Metallurgical Engineering Consultants
MIDR	Mining-Induced Displacement and Resettlement
MoEF	Ministry of Environment and Forest
MoU	Memorandum of Understanding
MT	Million Tons
MTPA	Million Ton Per Annum
NALCO	National Aluminium Company
NGO	Non Government Organisation
NTFP	Non Timber Forest Product
PAPs	Project Affected Persons
PDS	Public Distribution System
PESA	Panchayat Extension to Scheduled Areas
R and R	Resettlement and Rehabilitation
RF	Reserve Forest
SC	Scheduled Caste
SHG	Self Help Group
ST	Scheduled Tribe
TERI	The Energy and Resources Institute
TPY	Ton Per Year

Executive Summary

According to the Geological Survey of India, bauxite deposits of Andhra Pradesh (AP) and Orissa, referred as the East Coast Bauxite deposits are the largest bauxite reserves in the country, with Orissa accounting for 51 percent and AP 21 percent of the total reserves in India. Though bauxite mining started in Orissa long back (25 years), it is yet to start in AP. The causes for this obstacle in AP are control of technology by a few multinational companies, lack of financial resources, violent Maoist movement gaining strength in the bauxite hills, and the awakening of the civil society to the negative consequences of bauxite mining. However, the present Congress Government has again promoted this project.

The main objectives of this study are to map the existing livelihoods pattern of the affected communities in the mining and refinery areas that have been initiated in the Eastern Ghat areas of AP, and to assess how mining will influence the livelihoods of the communities. It also tries to understand the Resettlement and Rehabilitation (R and R) packages and the perception of the communities on the R and R policies. It uses both primary and secondary sources of information and analysed the same within a sustainable livelihood framework. The report has been accomplished in five chapters including introduction and conclusion.

The introductory chapter provides a discussion on the background of the study, methodology, research gaps and limitations of the study. The second chapter discusses the profile of mining with special reference to bauxite mining in India in general and AP in particular. It has provided a detailed status of different types of minerals including that of bauxite mines in different regions of AP. It also discusses the special status of bauxite mines located in different regions of AP and proposed refinery and mining activities because of the MoUs signed by the AP Government. It is pointed out that a large chunk of the forest area has been diverted for mining purposes, as the mines are located in forest areas. There has been public concern about the loss of livelihood of local communities, wildlife and sources of water due to diversion of forests in the Visakhapatnam District since long and these issues have once again come to centre stage due to the recent agreement for mining of bauxite.

The focus of chapter III is twofold. It captures the existing pattern of livelihoods of affected communities in the mining areas. It also assesses the impact of the proposed mining on the livelihood of the local communities. The analysis is based on data collected

from 12 villages in the refinery and mining areas, in the light of the sustainable livelihood framework. The socio-economic characteristics of households residing in the Jindal Mining and Refinery areas are dominated by tribal population. Farming, wage labour, Podu cultivation and collection of non-timber forest products are the major sources of livelihood here. By contrast, the majority of population, living in Anrak Refinery areas, belong to other Backward Castes, and farming and wage labour are their important sources of livelihood. The majority of the villages have basic infrastructure such as school, road, electricity and drinking water. In all the study villages women's participation is very high in traditional activities like wage labour and collection of NTFP. However, their access to formal jobs is very low due to lack of human capital. According to sustainable livelihood approach, people require a range of assets to achieve positive livelihood outcome that they seek. Availability of different types of capital, namely, human capital, social capital, natural capital, physical capital and financial capital in the study areas is discussed.

Human capital is required to make use of any of the four types of capital. But it has been found that the overall literacy in general is low, and that of females is much lower in comparison with their male counterparts. Similarly, access to healthcare in the mining area is low. Households residing in the refinery area are mostly poor with only access to natural capital and a majority of them are illiterate, deprived of food security for the major part of the year. As a result, they have to rely more on wage labour and collection of NTFP. By contrast, households located in Jindal Mining areas own agricultural land and have access to forest. Agriculture is the main source of income in addition to collection of forest products.

Given these contrasting scenarios, what will be their prospective livelihood status after the refinery and mining operation begin, are subject of discussion of next chapter. Chapter IV provides a discussion on mining-induced displacement and its consequences. It particularly analyses the displacement scenario, R and R packages promised and implemented by both companies. In the absence of provision of land to the displaced households, the percentage of households that going to lose cultivated land is very high. Companies, in both the areas have promised compensation for loss of land and other assets, and one job to each patta holder. But given the low level of education among the members of households in both the areas, they have been accommodated as low skilled menial jobs. A majority of the patta holders have received monetary compensation for the displaced land, which varies from Rs.2 lakh to Rs.4 lakh and some amount of money for loss of other assets.

A substantial amount of compensation money received by the affected households has been spent on unproductive expenditures and the rest of the funds have been deposited in their bank accounts. However, this saving can be spent at any time by the households for any purpose. Further, the Jindal Company has promised to allot some shares in the company. But the compensation principle is mostly in terms of money and the amount given to the affected families may not strengthen sustainable livelihoods of the displaced families.

The last chapter provides a summary of the main findings of the study. Compensation policies followed in the area in the light of good policies followed in other countries are evaluated. It is concluded that the compensation policy followed in the study areas is not enduring for sustainable livelihood.

About Author

An economist specializing in environmental and natural resource economics, **Prajna Paramita Mishra** is Assistant Professor, Research Unit for Livelihoods and Natural Resources (RULNR) at the Centre for Economic and Social Studies (CESS), Hyderabad. She did her Ph.D jointly from CESS and University of Hyderabad. She was the recipient of ICSSR Institutional Doctoral Fellowship at CESS and Commonwealth split-site Scholarship tenable in the United Kingdom to pursue research as a visiting student at the University of East Anglia, Norwich, UK. Her research interest includes mining, livelihood analysis and economic valuation.

A political scientist and public administration specialist, **M.Gopinath Reddy** is Professor and Principal Coordinator, Research Unit for Livelihoods and Natural Resources (RULNR) at the Centre for Economic and Social Studies (CESS), Hyderabad. He specializes in decentralized governance, livelihoods and poverty analysis and institutional approaches to natural resource management. He has to his credit more than 35 publications in international and national journals and has also edited some books.

CHAPTER - 1

INTRODUCTION

1.1 Introduction

On 1st July, 2005, a Memorandum of Understanding (MoU) was signed between Jindal South West Holding Limited (JSWHL) of the Jindal Group and the Government of Andhra Pradesh (GoAP) to set up an alumina and aluminum¹ refinery and smelter to produce about 2,50,000 tons of aluminum per annum initially, with a provision for suitable expansion in the state of Andhra Pradesh (AP), at locations other than the Scheduled Areas, with a capital outlay of about Rs.90 million. This was followed by another MoU, on 14th February, 2007, between the Government of Ras Al Khaimah (GoRAK), from the United Arab Emirates and the GoAP to set up an alumina and aluminum refinery and smelter to produce one Million Tons (MT) of alumina and 2,50,000 tons of aluminum per annum initially, with a provision for suitable expansion, in the state of AP, at locations other than the Scheduled Areas, with a capital outlay of about US\$2 billion. The GoRAK created an Indian company called ANRAK, and JSWHL created JSW Aluminium Limited (JSWAL), as a special purpose vehicle to implement these projects. Both companies will allot minority shares to the GoAP as part of the MoUs.

The two cases were identical in their plans to mine bauxite from the Agency Area of Visakhapatnam District via government-owned Andhra Pradesh Mineral Development

¹ Aluminum originates as an oxide called alumina. Aluminum itself does not occur in nature as a metal. Deposits of bauxite ore are mined and refined into alumina – one of the feed stocks for aluminum metal. At the refinery, alumina is extracted from the bauxite ore; and at the smelter, aluminum is extracted from its oxide alumina.

Corporation (APMDC)². According to the MoU, APMDC/GoAP should not sell or export bauxite from these deposits to any other party without meeting the requirements of the said company. APMDC will supply bauxite to Jindal from Araku (Galikonda, Raktakonda and Chitaamgondi) and Saparla groups, consisting of approximately 2,446 hectares and containing approximately 240 MT of bauxite ore. Bauxite for Anrak will go from the Jerrala Group of deposits, Chintapali Mandal, spread over 1,649 hectares with probable reserves of 224 MT. The proposed refinery of Jindal is in the plain area³ of S.Kota Mandal of Vizianagaram District, and the proposed alumina complex of Anrak is in the plain area of Makavarapalem Mandal of Visakhapatnam District.

1.2 Statement of the Problem

Both these mining areas come under the Fifth Schedule of the Indian Constitution⁴. They are home to several tribal populations, belonging to *Bhagata*, *Khond*, *Konda Reddi*, *Samantha* and other communities. Twenty-seven hills in Visakhapatnam District have been identified for bauxite mining. Each mining site has at least 10 villages surrounding it, which means that approximately 270 villages will be adversely affected (Ganjivarapu 2007). The affected that include the tribal people from Visakhapatnam and Vizianagaram districts, and agriculturists are strongly protesting against the government's efforts to start mining. According to them, bauxite mining will bring disaster to the area.

² In the landmark Samata Judgment of 1997, the Supreme Court ruled that the state has no right to grant leases even on government-owned forest land to private companies on areas governed by the Fifth Schedule of the Constitution, and that only cooperative societies solely run by Scheduled Tribes could mine in such areas, subject to compliance with the Forest Conservation Act and the Forest Protection Act. As a result of the judgment, the AP Government was directed to stop all private mining within Scheduled Areas. As the area with bauxite reserves in the state came under the notified tribal zone, it could be leased out only in favour of the tribals or state-owned enterprises as per the directives. Accordingly, the AP Government decided to offer lease rights to the APMDC and sell the bauxite to the aluminum companies. By using APMDC as a dummy corporation, the government is trying to avoid the ruling in the Samta Judgment. However, it is also illegal to use APMDC as a dummy on behalf of private companies.

³ According to the AP Land Transfer Regulation 1959, transfer of tribal areas to non-tribals is prohibited. Therefore, they have proposed to construct the refinery in a non-tribal area.

⁴ The Fifth Schedule of the Constitution of India deals with the administration and control of Scheduled Areas and Scheduled Tribes in these areas. It covers tribal areas in 9 states of India namely Andhra Pradesh, Jharkhand, Gujarat, Himachal Pradesh, Maharashtra, Madhya Pradesh, Chhattisgarh, Orissa and Rajasthan.

Displacement of tribals is the foremost concern. Most of the jobs would be technical, and in the modern mechanized mining sites, there will be very little scope of employment for tribals. They depend on forest for their livelihoods and destruction of forest will ruin their livelihoods. NGOs and media representative raised concerns that mining will disturb the hill streams which supply water to the plain areas. The mining areas are catchments to important rivers such as Sileru, Matchkhaund and their tributaries, the Gosthani and Sarada. According to an article, “Bauxite Mining is Disastrous: NGO”, published in the Hindu on 19th July 2005, the hills with bauxite reserves generally act like a hard cap to protect the soil and moisture of these hills, once the layer is removed, it (large scale mining) would completely denude the soil and biodiversity, besides dangerously affecting the water table. The groundwater in the area will be completely exhausted. Visakhapatnam City is already facing water scarcity, which will be further aggravated. All these issues need to be better investigated. There are coffee plantations below the bauxite-rich areas, and the villagers grow rice, pulses and beans there. Around 2,025 ha of coffee plantations will be lost if the mines come up; numerous workers in the plantations will lose their jobs (Bhatta 2008).

The Environment Protection and Research Institute (EPTRI), Hyderabad, has submitted a proposal to the Ministry of Environment and Forests (MoEF) to declare the area as “ecologically sensitive”, owing to its rich natural diversity. According to the The Energy Resources Institute (TERI) report, 2001, “to have access to the bauxite deposits around, 25 major tribal villages in the Eastern Ghats have to be displaced, around 10,000 trees have to be pulled out, and the state will lose around Rs.1,520 crores in terms of environmental degradation such as soil erosion. There is fear over the threat posed to the *Girijan* lifestyle and the ecosystem of the Eastern Ghats” (Ganjivarapu 2007).

According to the former Andhra Pradesh State Mines and Geology Minister, Ms P. Sabita Indra Reddy, the JSW project would offer employment to 3,000 directly and over 10,000 indirectly. Of this, a majority of the jobs would be offered to the local tribals. The Government would strive to ensure basic amenities to the tribals in the bauxite mining area in the form of schools, hospitals and other social infrastructure, even before the JSW project takes off. In terms of the current regulations, nearly 40 percent of the royalty received from bauxite mining would be spent on tribal development initiatives. This poses a big question is this really going to materialize?

Samata and AP *Girijana Sangham* demand that the project be stalled, and have been organizing several awareness programmes about the harmful effects of bauxite mining, and protest rallies and *dharnas* to stall the project. The project violates the Regulation 1 of 70 of the Andhra Tribal Land Transfer (Prevention) Act. As the area with bauxite

reserves in the State is under the notified tribal zone, it could be leased out only in favour of tribals or state-owned enterprises, as per Supreme Court directives. In the “Samata Judgment” the Supreme Court has clearly stated that only the Government, public sector undertakings and local tribal societies are empowered to take up mining. In this regard, *Gram Sabhas* in the tribal villages have also passed resolutions under Panchayat Extension to Scheduled Areas (PESA) Act. Therefore, it is interesting to study how they have dealt with all these acts in this area.

1.3 Research Gap

In January 1994, the Ministry of Environment and Forest (MoEF) issued the Environmental Impact Assessment (EIA) notification under the Environment (Protection) Act, 1986. The notification imposed restrictions on undertaking new development projects, or expansion or modernization of existing ones, unless environmental clearance was obtained from the ministry. The idea was to assess the principal environmental and social impacts of the projects to ascertain the likely costs and benefits of the proposed projects. In 1997, an amendment mandated a public hearing for a project before the final clearance. In September 2006, a new EIA notification was brought into force after “re-engineering” the existing provisions. It classified the projects into two categories: Category A (mining projects with a lease area of 50 ha or more) projects require clearance from the Central Government and Category B (projects smaller than 50 ha but more than 5 ha) projects can be cleared at the state level.

However, there are several drawbacks in the EIA. A consultant agency was commissioned by the project proponent to prepare the report. Therefore, it is no longer an impartial body. The same happened in case of bauxite mining in AP. The EIA for the proposed 1.4 MTPA alumina refinery and co-generation plant of Jindal at Srungavarapu Kota, Vizianagaram District, was prepared by Vimta Labs Ltd., Hyderabad. Similarly, the EIA for the proposed alumina refinery (1.5 MTPA), aluminum smelter (0.25 MTPA) and gas-based combined cycle co-generation plant (90 MW) at Makavarapalem Mandal of Visakhapatnam District by Anrak Aluminum Ltd. was prepared by B.S. Envi-tech (P) Ltd., Hyderabad. The EIA and Environment Management Plan for Jerrala Block and Araku and Anantagiri Bauxite Mines, Visakhapatnam District was submitted to the Andhra Pradesh Mineral Development Corporation (APMDC) by the Environmental Impact Assessment Division of the Indian Council of Forestry Research and Education (ICFRE), Dehradun.

A detailed analysis of these four EIA reports show that, they have neglected the socio-economic aspect. Neither there is any clear analysis about the existing socio-economic conditions of the people, nor on the future impact of mining on their livelihoods.

Therefore, the Research Unit for Livelihoods and Natural Resources (RULNR) of the Centre for Economic and Social Studies (CESS), Hyderabad, tried to fill this gap. To conduct this study Samata, a social justice organization in Visakhapatnam was identified as partner. Samata as a social justice organization works for the rights of the tribal people of AP and for the protection of the natural resources and ecology of the Eastern Ghats. They have immense experience in field coordination and data collection. Samata provided support in the form of providing field researchers, coordination at Visakhapatnam and overall coordination from Hyderabad.

1.4 Objectives

The study has the following main objectives:

- (i) To map the existing livelihoods pattern of the affected communities in the mining and refinery areas.
- (ii) To assess how mining will influence the livelihoods of the communities and what exactly will be the benefits and costs from the mining projects.
- (iii) To understand the Resettlement and Rehabilitation (R and R) packages and to study communities' perception on the same.

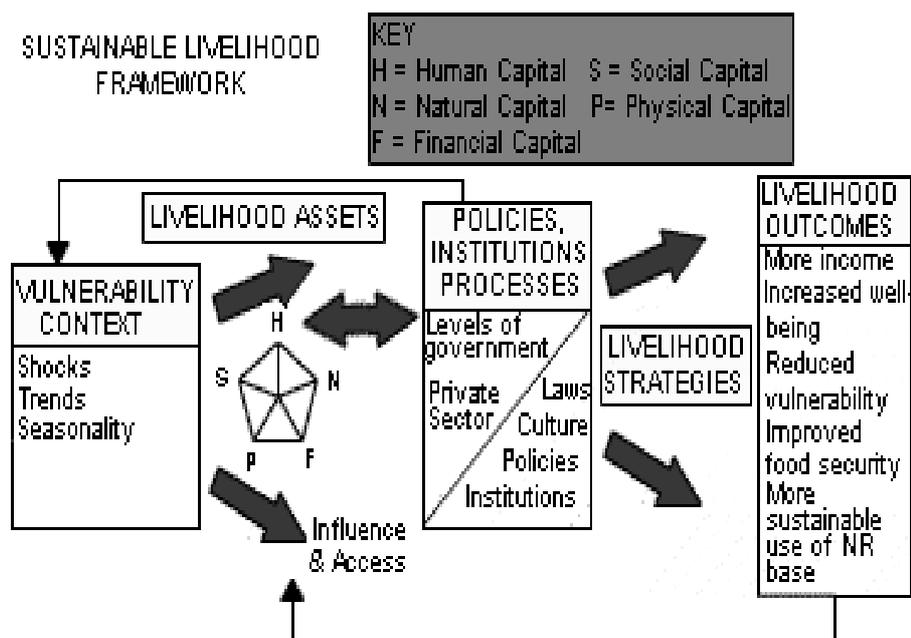
1.5 Conceptual Framework

Livelihood, in its simplest sense, is a means of gaining a living and comprises the capabilities, assets and activities required for a means of living. A livelihood is sustainable if it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation, and contributes net benefits to other livelihoods at the local and global levels in the short and long term (Chambers and Conway 1992). Ellis (2000) defines livelihood as that which comprises "... the assets (natural, physical, human, social and financial capital), the activities, and the access to these that together determine the living gained by the individual or household". This definition stresses the means rather than the ends.

Assets are stocks of productive factors that produce a stream of returns either in cash or in kind; for example, bank deposits, land, livestock, machinery, etc. Assets are of two types - Productive and Non-productive (Barrett and Reardon 2000). Productive assets are used as inputs in production; they generate income indirectly. For example, land, livestock, skills, etc. Non-productive assets generate income directly, for example, jewellery. Individuals, may privately own any of these assets, or they may be collectively held by a community. Activities are the particular uses of productive assets to generate income. For example, livestock can be used for crop production, manufacturing and livestock production.

The livelihood approach to understand the survival strategies of the poor people, as well as development process, has become increasingly popular in the last decade. Since the late 1980s, a new angle in these literatures has been the emphasis on sustainability. In its simplest form, the framework views people as operating in a context of vulnerability. Within this context, they have access to certain assets or poverty-reducing factors. These gain their meaning and value through the prevailing social, institutional and organisational environment. This environment also influences the livelihood strategies - ways of combining and using assets – that are open to people in pursuit of beneficial livelihood outcomes that meet their own livelihood objectives. These all relate to processes of change to the conditions in which people's livelihoods operate, and the response of livelihoods to these changes.

Figure 1.1 Sustainable Livelihood Framework



Source: DFID (1999)

This approach has largely been used in the agriculture and rural livelihoods projects, but its relevance to mining projects has not been much assessed. In this study, instead of starting with the vulnerability, it describes different economic activities the households of proposed mining and refinery villages are pursuing. The affects of these activities on the assets, in the form of five types of capital are studied. These assets influence and are

also influenced by the policies and institutions. Finally, they adopt different livelihood strategies, which result in the diverse livelihood outcomes.

People require a range of assets to achieve positive livelihood outcomes. They are, Human Capital, Natural Capital, Financial Capital, Physical Capital and Social Capital. These capitals are the different forms of livelihood assets that the households can use to make a living. *Human Capital* represents the skills, knowledge, ability and good health that enable people to pursue different livelihood strategies and achieve their livelihood objectives (DFID 1999). *Natural Capital*, which entered into the development discussion in the 90s, consists of two elements: Non-renewable resources such as minerals, forests and soils; and Renewable resources such as ecosystem services and nutrient cycling. Natural capital is measured in terms of changes in availability of drinking water, land quality, ground water and environment (Reddy and Soussan 2004). The conceptual definition of *Social Capital* is still being debated. The general notion is the existing stocks of mutual trust or connections between people that provide a flow of resources enabling not only solutions to problems but also pursuit of political and economic activities.

Physical Capital comprises basic infrastructure and producer goods needed to support livelihoods. Important components of infrastructure are affordable transport, secure shelter and buildings, adequate water supply and sanitation, clean affordable energy and access to information. Producer goods are the tools and equipment that people use to function more productively. *Financial Capital* denotes the financial resources that people use to achieve their livelihood objectives. They include savings and convertible liquid assets as well as regular flows of money such as earned income, pensions, transfer from the state and other remittances (DFID 1999).

1.6 The Methodology, Study Area and Sample Selection

Both primary and secondary sources of information have been collected for this study. Secondary information was collected from the Socio-Economic Survey of AP, Statistical Abstracts of AP, Geological Survey of India and the EIA reports of the companies. For primary data collection the survey was carried out in different phases from March, 2009 to June 2009. Household survey with a structured questionnaire was carried out with the help of a group of 12 trained assistants. This survey covered 355 households in Visakhapatnam and Vizianagaram districts of Andhra Pradesh. Another set of qualitative data was collected with the help of a structured village questionnaire. Small group discussions took place on the socio-economic condition of the villages. These discussions were informal in nature. Data were collected from 12 study villages.

Our study areas are situated in the Visakhapatnam and Vizianagaram districts of Andhra Pradesh. The study area is divided into four zones, which consist of four mandals: (1) S.Kota Mandal of Vizianagaram District (proposed Jindal Refinery), (2) Anantagiri/Araku Valley Mandal of Visakhapatnam District (proposed Jindal Mining), (3) Makavarapalem Mandal of Visakhapatnam District (proposed Anrak Alumina complex) and (4) G.K.Veedhi Mandal of Visakhapatnam District (proposed Anrak Mining). These zones are the start of the study. As this is a geographically well-defined area, it is very easy to identify the population by taking all the villages, which are near the proposed mines and refinery areas. The list of villages was prepared with the help of the EIA report. However, a visit to the study area shows that the EIA report did not include the small hamlets.

Therefore, according to the first field report, a list of villages and hamlets which are near the study area was prepared. Given the choice of a target population, the next step was to put together a list of the target population, known as the sample frame population, from which, ultimately, the sample was drawn. Secondly, a list of 15 villages⁵ was prepared, which is just within three kilometers from the proposed mines and refinery areas and where land acquisitions have either finished or just started (Table 1.1).

A look at the study villages shows that Jindal Mining area is tribal dominated; Anrak Refinery area is dominated by Backward Castes and Jindal Refinery area has a mixed population, though the majority is tribal. Therefore, instead of studying the existing livelihoods of the tribals (at the beginning of this project the idea was to concentrate on tribal livelihoods), it was decided to study the livelihoods of the affected communities. The sampling of the households was done as per the following procedure: as the villages near the refinery are comparatively bigger, 30 percent of the households were taken as sample households. Habitats near mining area are small hamlets, so 50 percent of the households were taken as sample households. Finally, 355 households are selected: 138 from Jindal Refinery area, 51 from Jindal Mining area and 166 from Anrak Refinery area.

1.7 Report Structure

The present chapter is an introduction to this work. It starts with the background about how the AP Government has signed the MoU with companies for bauxite mining. Then

⁵ Presence of Naxals prevented us from collecting data in the Anrak Mining area. Therefore, our final study is based on 12 villages instead of 15 villages. Anrak Mining area is excluded from all the following chapters.

Table 1.1
List of the Study Villages

Village Name	Distance from Refinery/ Mining (km)	Acquisition Land/ Home stead	Total No. of Households					Total Sampled Households				
			SC	ST	BC	OC	Total	SC	ST	BC	OC	Total
JINDAL REFINERY – S. KOTA												
Cheedipalem	0	Agr. Land & Home stead	1	52	2	-	55	1	18	-	-	19
Chinakandepalli	1	Agr. Land	-	5	47	-	52	-	4	14	-	18
Addateega	0.5	Agr. Land	1	52	5	3	61	-	14	3	2	19
Rayavanipalem	1.5	Agr. Land	-	34	7	-	41	-	9	3	-	12
Ammapalem	3	Agr. Land	31	127	44	7	209	8	42	11	1	62
Mettapalem	3.5	Agr. Land	-	20	-	-	20	-	8	-	-	8
Total												138
JINDAL MINING – ANANTAGIRI												
Chettamgondi	0	Agr. Land & Home stead	-	20	-	-	20	-	10	-	-	10
Barajola	0.5	Agr. Land	-	40	-	-	40	-	20	-	-	20
Eugovasova	0.2	Agr. Land & Home stead	-	42	-	-	42	-	21	-	-	21
Total												51
ANRAK REFINERY – MAKAVARIPALEM												
Dharmavaram	0.5	Agr. Land	-	-	45	-	45	-	-	13	-	13
Kottapalem	0	Agr. Land & Home stead	9	-	141	-	150	5	-	40	-	45
G Venkatapuram	0	Agr. Land & Home stead	3	-	354	5	362	2		104	1	107
Total												165
ANRAK MINING – GK VEEDHI												
Rallagedda												
Egajanaba												
Chintalawada												
Total												

Source: Field Study (2009)

it mentions the related problems with bauxite mining and how the agitation is going on. It talks about the research gap followed by objectives and methodology. The second chapter gives a profile of mining in AP, particularly bauxite mining. It also gives a pan India picture of bauxite mining and discusses why it has not started in AP yet. The third chapter deals with the study of existing livelihoods of the affected communities. It discusses how people have access to different types of capitals and how mining will change their livelihoods. Chapter four concentrates on Resettlement and Rehabilitations. It studies how the Government of AP is dealing with the same and how people are reacting about the given packages. Chapter five concludes the study.

CHAPTER - 2

MINING SCENARIO IN ANDHRA PRADESH

2.1 Mining in Andhra Pradesh

Andhra Pradesh, renowned as the mineral storehouse of South India, stands 1st among the important mineral producing states of the country. During 2006-07, the mineral revenue of the state rose to Rs. 1,363.06 crores⁶. The state has identified 48 varieties of minerals; important among them are gold, diamond, bauxite, limestone, coal, oil and natural gas, manganese, dolomite, calcite, iron ore, barytes, uranium, granite, etc. In addition to the identified and explored mineral deposits, there are vast tracks of virgin areas in tribal areas of Eastern Ghats and Nallamalai areas. With such vast mineral potential, the state has formulated strategies to explore, exploit and develop the mineral sector with public-private partnerships (Government of Andhra Pradesh 2008). Table 2.1 shows the mineral reserves of Andhra Pradesh.

Andhra Pradesh has the highest reserves of barytes in the country. The state is the leading producer of barytes and contributes about 90 percent to the total country's production. Huge reserves are found in Kadapa, Prakasam and Nellore districts (Table 2.2). The world's largest single deposit with an estimated reserve of 70 MT occurs in Mangampet, Kadapa District. The state has 54 percent of India's ball clay reserves. There is a vast scope to develop and export calcite from the state. Limestone in AP is being exploited locally and exported to different parts of the country and other countries for flooring. The state has 39 percent of India's gold reserves and during the regime of Vijayanagaram Empire also it was known for gold mining. The state has 30 percent of bauxite, which is not yet explored. The state is also known as one of the best diamond reserves in the country, with a 16 percent reserve. The state is the only producer of coal in South India. It is also one of the few states producing manganese ores.

⁶ Other mineral- rich states are Jharkhand (Rs. 1008 crores), Rajasthan (Rs. 809.95 crores), Orissa (Rs.765 crores), Chhattisgarh (Rs.737.85 crores), Maharashtra (Rs. 691.61 crores), Tamil Nadu (Rs. 414 crores) and Karnataka (Rs. 308 crores).

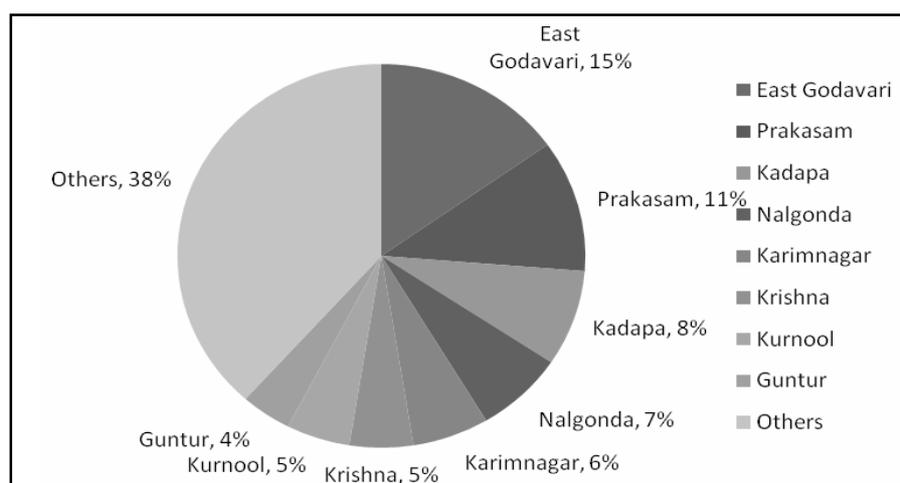
Table 2.1 Mineral Reserves of Andhra Pradesh

Sl. No.	Minerals	Andhra Pradesh (MT)	India (MT)	% of AP Reserves
1	Barytes	67.05	70.15	95.58
2	Ball Clay	7.5	13.90	54
3	Calcite	3.9	10.6	41
4	Limestone	30400	76446	40
5	Gold Ore	6.84	17.70	39
6	Bauxite	750	2525.33	30
7	Diamond	194990 Carats	1196154	16.3
8	Asbestos	0.25	2.3	11
9	Coal	13021.50	229962.28	6
10	Manganese	7	176.5	4

Source: <http://www.aponline.gov.in> (2009)

Nellore and Kurnool districts account for almost 15 percent each of the total mines in the state. In terms of area (excluding fuel and minor minerals), the top five most mined districts in the states are Nellore (14 percent), Nalgonda (11 percent), Kurnool and Kadapa (10 percent each) and Guntur (9 percent) (CSE 2008). However, in terms of mineral revenue (excluding coal), East Godavari leads the list followed by Prakasam and Kadapa (Figure 2.1).

Figure 2.1 District-wise Mineral Revenue in Andhra Pradesh (2006-07)



Source: Government of Andhra Pradesh (2008)

Table 2.2 District-wise Production of Minerals in Andhra Pradesh

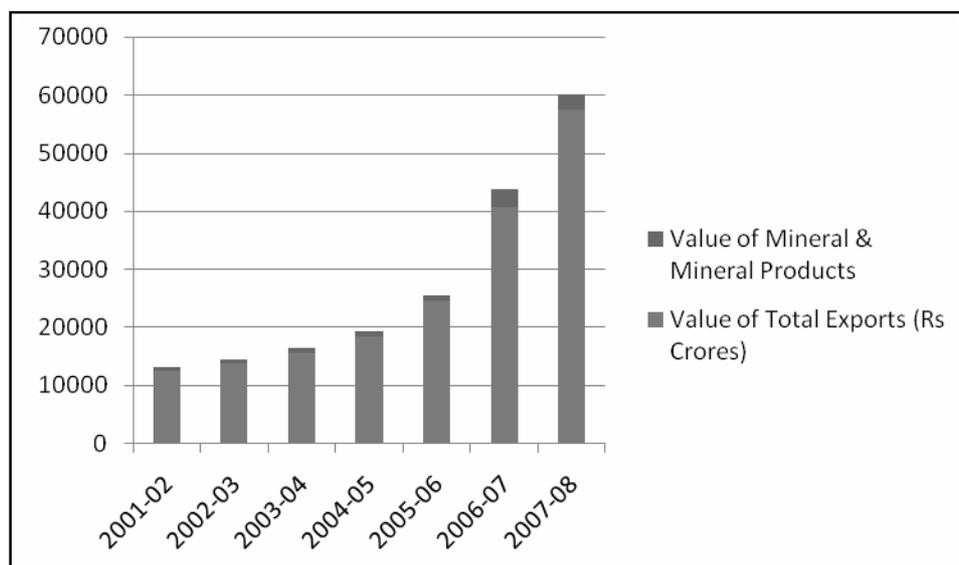
Sl. No.	Districts	Major Minerals
1	Srikakulam	-
2	Vizianagaram	Manganese ore
3	Visakhapatnam	Apatite,
4	East Godavari	Ball Clay, Fireclay, Laterite
5	West Godavari	Ball Clay, Fireclay
6	Krishna	Limestone
7	Guntur	Limestone
8	Prakasam	Barytes
9	Nellore	Mica
10	Chittoor	-
11	Kadapa	Asbestos, Barytes, Dolomite, Iron ore, Laterite, Limestone
12	Anantapur	Dolomite, Iron ore, Limestone,
13	Kurnool	Dolomite, Iron ore, Limestone
14	Mahbubnagar	-
15	Ranga Reddy	Limestone
16	Hyderabad	-
17	Medak	-
18	Nizamabad	-
19	Adilabad	Manganese ore, Limestone, Coal
20	Karimnagar	Limestone, Coal
21	Warangal	Coal
22	Khammam	Barytes, Dolomite, Coal
23	Nalgonda	Limestone

Source: Government of Andhra Pradesh (2008)

So far 1,727 mining leases for major minerals and 6,736 quarry leases for minor minerals were granted under both private and public sectors. Coal, barytes, oil and natural gas are exclusively mined by the public sector, which forms major mineral revenue to the state. Limestone and dolomite are being exploited under public and private sector (Government of Andhra Pradesh 2008). The state produces 80 to 90 MT of major minerals and 235

to 250 million cubic meters of minor minerals. Nearly 90 percent of the mines fall under small sector, and the remaining 10 percent are under medium and large sectors. The value of exports in the mineral and mineral products has also grown over the last few years (Figure 2.2).

Figure 2.2 Value of Exports from Mineral and Mineral Products in Andhra Pradesh



Source: Government of Andhra Pradesh (2007)

In Andhra Pradesh, the total value of exports has increased from 12,400 crores in 2001-02 to 57,343 crores in 2007-08. Though mineral and mineral products have a very small percentage in this total value, there is an increasing trend over the years. It had a total value of 634 crores in 2001-02, which increased to 3,083 crores in 2006-07, and slightly dropped to 2,711 crores in 2007-08.

2.2 Bauxite Mining in India

India is the fourth largest producer of bauxite in the world next only to Australia, China and Brazil (US Geological Survey, 2009). The principal states with bauxite reserves include Orissa (51 percent), Andhra Pradesh (21 percent), Gujarat (6 percent), Uttar Pradesh (6 percent) and others (16 percent). The National Aluminium Company (NALCO) is the leading producer of bauxite in India. Gumla District in Jharkhand, Siridih, Kawardagh and Sarguja districts of Chhattisgarh and Koraput District of Orissa are the major bauxite mining districts in India.

Figure 2.3 Bauxite Mines in India



Source: <http://www.mapsofindia.com/maps/minerals/bauxite-mines-map.html>, 21st August, 09

2.3 Bauxite Mining in Andhra Pradesh

According to the Geological Survey of India (GSI, 1979) the bauxite deposits of Andhra Pradesh and Orissa, referred as the East Coast Bauxite deposits of India have an estimated reserve of around 2,000 MT. This is the largest bauxite reserve in the country, with

Orissa accounting for 51 percent and AP 21 percent of the total reserves of India. Andhra Pradesh has an estimated reserve of nearly 600 MT (Table 2.3). The East Coast bauxites of Andhra Pradesh and Orissa are bound by the north latitudes $17^{\circ} 47'$ and $19^{\circ} 45'$ and the east longitudes $81^{\circ} 53'$ and $83^{\circ} 30'$. They are scattered over a length of 400 km and a width of 30 km in an approximate NE-SW alignment in the southern part and north-south in the northern part, which is in conformity with the general trend of the Eastern Ghat hill ranges. The bauxite deposits of Andhra Pradesh are broadly divided into Araku, Chintapalli and Gurtedu groups.

Table 2.3 Bauxite Deposits of Andhra Pradesh

Group	Deposit Size (Million Tonnes)	Mine Area (Hectares)
Araku Group (Visakhapatnam)		
Chittamgondi	28.5	152
Galikonda	14.5	61
Raktakonda	8.6	42
Total Araku	51.6	255
Chintapalli Group (Visakhapatnam)		
Gudem	38.4	263
Jerrala	246.0	1,350
Sapparla	186.3	1,513.2
Total Chintapalli	470.7	3,126.2
Gurtedu Group (East Godavari)	42.6	180
Total	564.9	3,561.2

Source: Geological Survey of India (1979)

Prior to the GSI exploration in the year 1971, the Directorate of Geology and Mining, GoAP, examined and estimated small reserves of bauxite in AP (Indian Bureau of Mines 1977). In April, 1975, the AP Industrial Development Corporation (APIDC) contracted centre-owned Metallurgical Engineering Consultants (MECON) for a pre-investment study for the exploitation of bauxite in the state. In 1987, MECON prepared a feasibility report along with Al Union Research and Design Institute of

Aluminium Magnesium and Electrode Industry of former USSR. However, for multiple reasons, exploitation never became a reality (Mitra 2000). In 2000, another initiative was taken by the then Chief Minister (CM), Mr. N. Chandrababu Naidu, to exploit the bauxite resources with a Dubai-based company. The company insisted on transfer of land for mining to it, which implies amending of Land Transfer Regulation (LTR) 1 of 1970. Further, the Supreme Court of India, in *Samata vs. State of AP* case, gave a ruling that a state-owned corporation can mine these areas. A large section of the tribals opposed this plan and the government dropped the idea of mining.

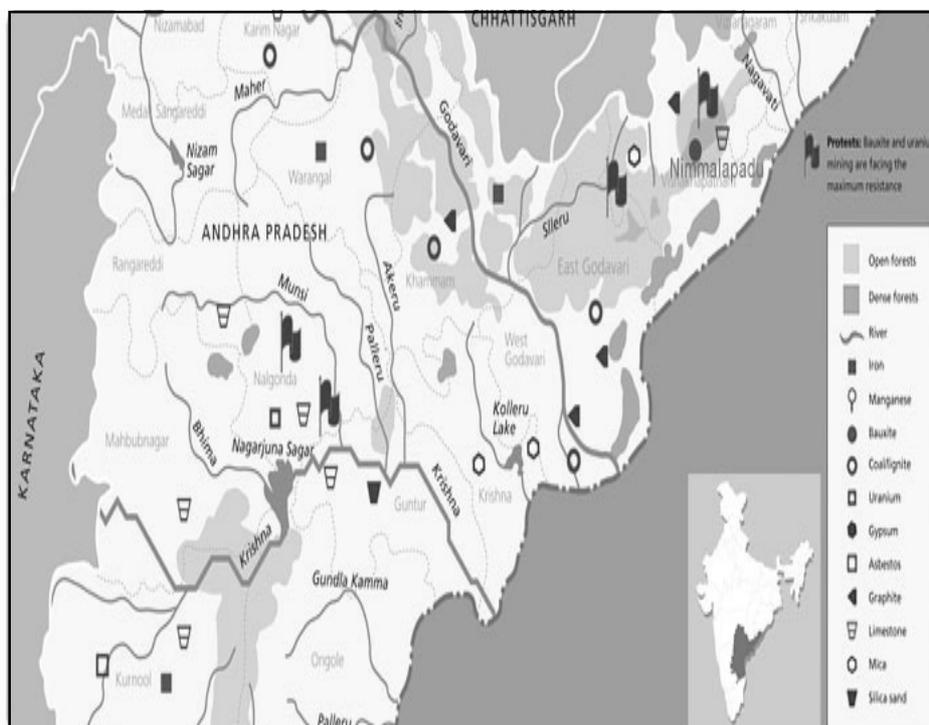
According to Oskarsson (2009), serious obstacles to bauxite mining in the past were the control of technology by a few multinational companies in the 1980s, along with lack of financial resources. Later in the 1990s, a violent Maoist rebel movement gained strength in the bauxite hills of AP, and since the mid to late 1990s, as money and technology became available, the civil society awakened to the negative consequences of bauxite mining; these became significant factors in delaying the projects, mainly through legal activism. The present Congress Government is again promoting these projects and two MoUs were signed.

Recently, the National Aluminium Company (NALCO), got the no objection certificate from the Andhra Pradesh Government for grant of two bauxite mining leases in two blocks of Visakhapatnam and East Godavari districts. These two blocks, with a combined reserve of 80 MT of bauxite, were allotted to NALCO for its proposed 1.4 MT per annum refinery in Andhra Pradesh. NALCO will invest around Rs.7,000 crore for setting up the alumina refinery and other mining operations. The refinery project is likely to come up in Visakhapatnam District, but the exact location is not decided. The refinery is expected to be ready in 2011, and it is scheduled to be operational by 2013 (Business Standard 2009). However, this part (NALCO Mining) is not included in our study as this is a very recent phenomenon.

2.4 Mining in Forest Areas of Andhra Pradesh

According to the Ministry of Mines (2008), Government of India, the total forest land diverted for mining in India has been estimated to be as high as 1,14,304.45 ha between 1980 and 2008. Chhattisgarh tops the list, followed by Andhra Pradesh and Orissa. In Andhra Pradesh, about 18,178 ha of forest land was diverted for mining. This is the second highest diversion of forest land for mining during this period in the country, after Chhattisgarh. The forests in regions like Adilabad, Karimnagar and Warangal, which hold both forest and mineral resources (CSE 2008), are under threat.

Figure 2.4 Mining in Forest Areas of Andhra Pradesh



Source: Centre for Science and Environment (2008)

Some of the most pristine forests in Andhra Pradesh are seen in the Eastern Ghats in the areas bordering Khammam, West Godavari, East Godavari and Visakhapatnam districts. Bauxite mining in Eastern Ghats will devastate the ecology of the area and coal mining in Khammam has resulted in the clearance of vast stretches of deciduous forests (Vaghlikar, Moghe and Dutta 2003). According to Press Information Bureau (2009), the Minister of State for Environment and Forest, Jairam Ramesh, informed the Rajya Sabha in response to a question that the maximum amount of protected forest land had been diverted for coal mining in Andhra Pradesh (12,709.62 ha), followed by Chhattisgarh (12579.12 ha) and Madhya Pradesh (10,980.37 ha).

In October 2000, Samata sent a letter to the Regional Chief Conservator of Forests (CCF), South Zone, raising concerns about the proposed opening of bauxite mining in the following areas of Visakhapatnam District; they are Rakhthakonda in Anantagiri II Reserve Forest (RF), S. Kota Range; Galikonda in Sunkarmetta RF, Araku Range; Chittamgondi in Muliyaguda RF and Araku Range. The letter stress the importance of these areas from the point of view of both wildlife and local communities, and also states

that these areas also form the catchment for the Machkund, Sileru, Gosthani and Sarada rivers and bauxite mining will have tremendous impact on all these.

The present study area is rich with bauxite and forests. Therefore, this study will try to find out how people of that area depend on forest for their livelihoods and how mining will change this. The next chapter tries to map the existing livelihoods of the affected communities – Is it sustainable or not? Once mining/refinery starts what will be the source of livelihoods for these people, and how they will cope with the adverse situation.

CHAPTER - 3

LIVELIHOODS OF AFFECTED COMMUNITIES

3.1 Introduction

The conventional view on mining sees mineral reserves that can be mined profitably as part of a country's stock of natural capital, along with agricultural land, forests and other natural resources (Davis and Tilton 2005). It was widely assumed that countries that possess rich mineral deposits are fortunate. However, over the last few decades, a more negative view of mining has emerged, that questions the positive relationship between mineral extraction and economic development (Davis and Tilton 2005). Mining profoundly impacts local communities in the form of jobs, migrant workers, land, water, air and noise, loss of wildlife habitat, increased tax revenue, etc. The argument is that the impact of mining on the livelihoods of the local communities is largely neglected. Often, all the benefits accrue to the mining industry and its work-force, depriving the rest of the population in the locality. This population bears only the costs, while the provision of benefit is lopsided.

A livelihood is often conceptualized as “incomes in cash and in kind: as well as the social institutions (kin, family, compound, village), gender relations, and property rights required to support and sustain a given standard of living” (Ellis 1998, quoted in Chimhowu and Hulme 2006). This includes the accessibility of, and benefits derived from, public services like education, health, roads, water and related infrastructure. Livelihood approaches involve a conceptual shift from analyzing rural people as smallholder farmers to a much broader understanding (Murray 2002, quoted in Chimhowu and Hulme 2006).

Several frameworks have been proposed for the analysis of livelihoods. They include the Sustainable Livelihoods Framework (SLF) (Carney, 1998,1999; Scoones, 1998), the Framework for Thinking about Diverse Rural Livelihoods (Ellis 2000), Capitals and Capabilities Framework of Bebbington (1999), and the United Nations Development Programme's (UNDP 1999) Sustainable Livelihoods Diamond. These frameworks have different emphases, rather than fundamental differences. They all attempt to integrate assets, constraints and human capabilities in a logical and comprehensive manner to

analyze the status, form, nature and condition of livelihoods over space and time (Chimhowu and Hulme 2006). Among these frameworks, the SLF has been the most popular, partly because of its robust analytical ability and also because of its widespread promotion by donor agencies (Chimhowu and Hulme 2006).

According to the SLF, households make a living by using five types of assets / capital (natural, physical, human, social and financial) in an environment influenced by institutional and structural factors. It identifies vulnerability as a key factor that households seek to manage. There are five key features, which make the framework very relevant. Firstly, it views households as making a living in a variety of ways of which farming is just one (Francis 2001; Murray 2002). Secondly, the framework sees land as just one asset among a group of other assets. Thirdly, it places the interaction between the various capitals within a broader policy environment. Fourthly, it allows investigating livelihood dynamics in a given geographical and physical context (Murray 2002). Fifthly, the focus on risk and vulnerability is appropriate.

As mentioned in the introduction chapter, bauxite mining and aluminum refineries have not yet started in the study area. Though land acquisition has started in both the refinery areas, people are still continuing with their existing livelihoods. Most of the impact assessment studies go for a before and after comparison or with-without comparison, considering a few control villages. However, this research has tried to study the existing livelihoods of the community in the pre-mining / refinery period. It is setting a baseline which can form the basis for a future impact assessment.

The main objectives of this section are:

- (i) To map the existing livelihoods pattern of the affected communities in the mining areas.
- (ii) To set a baseline study for future impact assessment.

The study is based on 12 villages in the mining and refinery areas⁷. The basic features of the villages under study have been presented in Table 3.1 and Table 3.2 provides some basic data on demographic features of sample villages.

⁷ A detailed of selection of villages is given in the introduction chapter

Table 3.1 Key Features of Sample Villages

Villages	Distance from Mines/ Refinery (km)	Total Population	Social Composition	Total House holds (No)	Livelihoods	Infra-structure in Village	Electricity	Water
Jindal Refinery								
Cheedipalem	0.1	185	Tribal	55	Cultivation, NTFP sale	Primary school, all weathered road, ICDS	Available	Surface water
Chinakandepalli	1	205	BC dominated	52	Cultivation wage labour	Primary school, all weathered road, PDS	Available	Piped water
Addateega	0.5	114	Mixed (tribal dominated)	61	Cultivation, wage labour	Primary school, all weathered road, ICDS	Available	Surface water
Rayavanipalem	1.5	145	Mixed (Tribal dominated)	41	Cultivation wage labour	Primary School, all weathered road, ICDS	Available	Surface water
Ammapalem	3	744	Mixed (tribal dominated) farm labour	209	Cultivation,	Primary school, all weathered road, ICDS, RMP	Available	Surface water
Mettapalem	3.5	77	Tribal	20	Cultivation, wage labour	Primary school, all weathered road, ICDS	Available	Surface water

Table 3.1 Contd...

Table 3.1 Contd...

Jindal Mining								
Chettamgondi	0	68	Tribal	20	Podu cultivation, NTFP sale	Primary school, all weathered road, ICDS	Available	Streams
Barajola	0.5	180	Tribal	40	Podu cultivation, NTFP sale, wage labour	Primary school, all weathered road, ICDS	Available	Streams
Eugovasova	0.2	193	Tribal	42	Cultivation, NTFP collection and sale	Primary school, ICDS	Available	Streams
Anrak Refinery								
Dharmavaram	0.5	157	BC	45	Cultivation, wage labour	Primary school, all weathered road	Available	Tube well
Kottapalem	0	613	BC dominated	150	Cultivation, wage labour	all weathered road, ICDS, PDS	Available	Tube well
G.Venkatapuram	0	1300	BC dominated	362	Cultivation, wage labour	UP school, RMP, ICDS, PDS	Available	Tube well

Source: Field Survey (2009)

All sample households are very near to the proposed mining and refinery sites. The distance of the villages from the proposed sites ranges from 0 to 3.5 km. Villages under Jindal Mining area are small hamlets and fully tribal villages. Villages near Anrak Refinery area are dominated by Backward Caste (BC) population. In Jindal Refinery area, two

Table 3.2 Demographic Features of Sample Villages

Village	Population			Total House holds (No.)	Sample Households (No.)				
	Male	Female	Total		SC	ST	OC	BC	Total
Jindal Refinery									
Cheedipalem	85	100	185	55	1	18	0	0	19
Chinakandepalli	99	106	205	52	0	4	14	0	18
Addateega	59	55	114	61	0	14	3	2	19
Rayavanipalem	75	70	145	41	0	9	3	0	12
Ammapalem	374	370	744	209	8	42	11	1	62
Mettapalem	33	44	77	20	0	8	0	0	8
Jindal Mining									
Chettamgondi	33	35	68	20	0	10	0	0	10
Barajola	87	93	180	40	0	20	0	0	20
Eugovasova	94	99	193	42	0	21	0	0	21
Anrak Refinery									
Dharmavaram	75	82	157	45	0	0	13	0	13
Kottapalem	306	307	613	150	5	0	40	0	45
G.Venkatapuram	642	658	1300	362	2	0	104	1	107

Source: Field Survey (2009)

villages are fully tribal, three villages have mixed composition, but dominated by tribal⁸, and another village is BC dominated. In both the refinery areas farm cultivation and wage labour are the major sources of livelihoods. On the other hand, in the mining areas, *podu* cultivation and Non-Timber Forest Product (NTFP) collection and sale are the major sources of livelihoods. Most of the villages have a primary school, all weathered road and ICDS. Electricity is available in all the villages. Surface water and tube wells are the major source of drinking water in the refinery areas and stream is the major source in mining areas. G. Venkatapuram is the village with the maximum number of households (362), with a population of 1,300. Chettamgondi and Mettapalem are two village / hamlets with minimum number of households (20) with a population of 68 and 77 respectively.

3.2 Diversified Rural Livelihoods

Livelihood diversification is a survival strategy of the rural households in developing countries, as agricultural activities are unable to provide sufficient means of survival (Hussein and Nelson 1998). Ellis (1998) defines livelihood diversification as "the process by which households construct a diverse portfolio of activities and social support capabilities for survival and in order to improve their standard of living". Livelihood diversification is normal for most people in majority of the rural areas of developing countries in both Asia and Africa (Adams 1994; Schoonmaker Freudenberger 1994), and non-agricultural activities are a critical component of such diversification. It has been confirmed by many researchers that rural people not only specialise in crop and fish production or livestock, but also depend on other activities (Dercon and Krishnan 1996; Ellis 1996; Unni 1996). This is reflected in all mining villages and control villages (Figure 3.1 and 3.2)

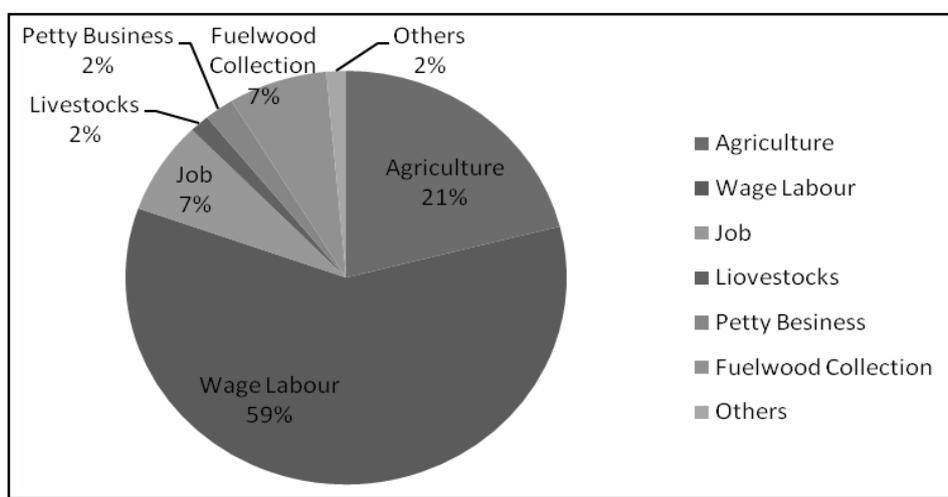
In both the refinery areas wage income (Jindal 59 percent and Anrak 68 percent) is the primary source⁹ of income of the sample households. This is followed by agriculture, which also has the same percentage (Jindal 21 percent and Anrak 22 percent). Though villagers devote a lot of time to agriculture, income from agriculture is not very high. Job

⁸ According to the MoU of AP Government with JSWHL, the refinery will come at a non-scheduled area. Even though the present refinery area of Jindal is not a Scheduled Area, tribal concentration is very high. There are Scheduled Areas in nine districts of AP notified under Schedule five of the Constitution. In these nine districts, some of the adivasi villages are not included. They are called non-scheduled Sub-Plan Villages. In the district of Visakhapatnam, there are 98 revenue villages and in Vizianagaram, 170 revenue villages, which are non-scheduled revenue villages.

⁹ Here primary income means the highest share of income coming from that source, for that particular household.

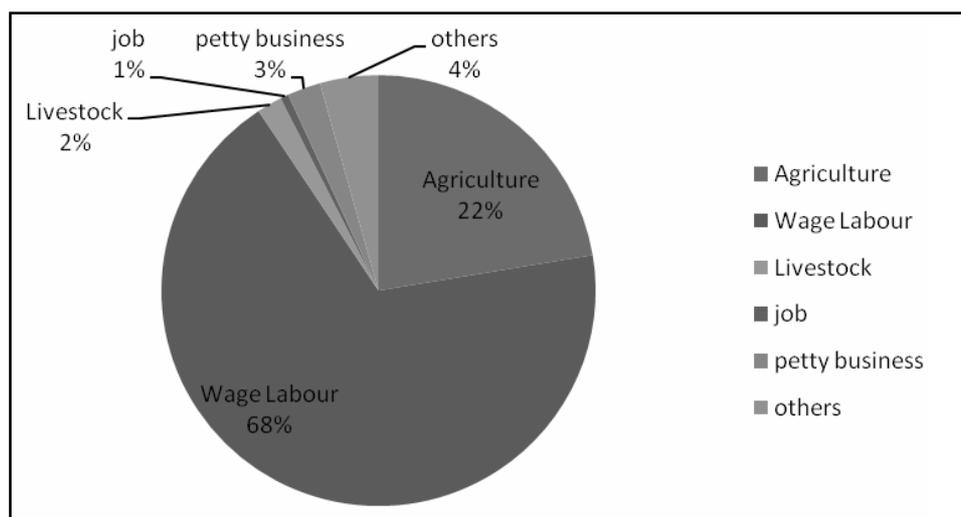
and fuelwood collection is the third source of primary occupation in Jindal Refinery area (both 7 percent each). Petty business and other occupations have a very small percentage (2 percent each). However, in the Anrak Refinery area, the percentage of other sources of income is very less. Here livestock is also a primary source of income for some households (2 percent). The percentage of job and business is very less.

Figure 3.1 Primary Occupation in Jindal Refinery Area



Source: Field Survey (2009)

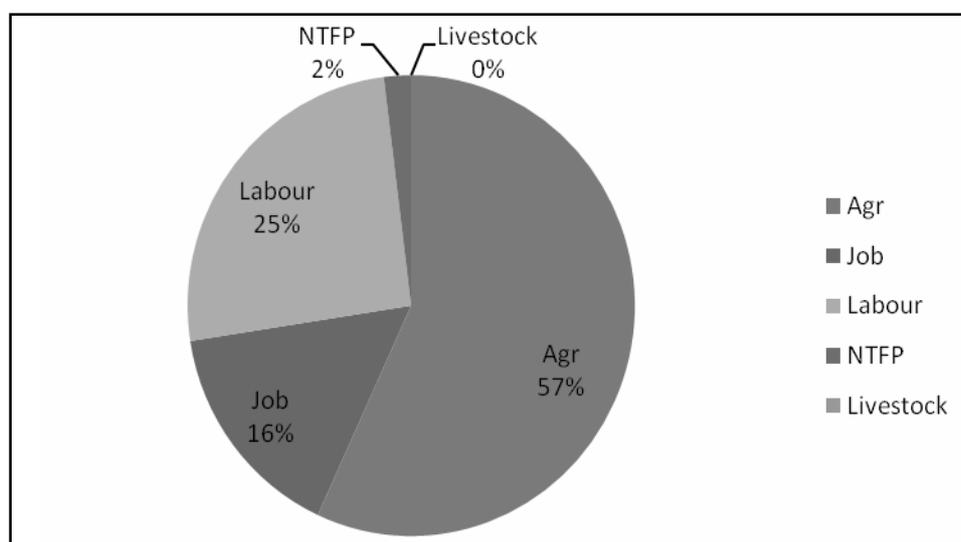
Figure 3.2 Primary Occupation in Anrak Refinery Area



Source: Field Survey (2009)

The primary occupation in the mining area is entirely different from that of the refinery areas. Here agriculture plays an important role and it is the primary source of income for 57 percent of the sample households. The second occupation is wage labour, which mostly involves labour work at coffee board. Every year they work in the board for three months. This is followed by employment. Here the percentage of job is very high in comparison to the refinery areas. Most of the jobs are in AP Mineral Development Corporation (APMDC). Income from NTFP and livestock are not major sources of income in the mining villages. Though many households have cattle and poultry and they collect NTFP most part of the year, income from that source is a secondary one.

Figure 3.3 Primary Occupation in Jindal Mining Area



Source: Field Survey (2009)

3.2.1 Livelihoods Diversification: A Gender Dimension

Many livelihood diversification strategies are often gender specific. Literature confirms that though women may undertake a similar wide range of diversified activities as men (Chen 1989), in many contexts men are able to avail themselves of diverse opportunities that are not open to women because of cultural constraints (Hussein and Nelson 1998). This section discusses all the economic activities taking gender into consideration (Table 3.3 and 3.4).

In Jindal Refinery area, majority of the active individuals devote their time (77 percent) to agriculture (Table 3.3). This is followed by farm and non-farm labour and jobs. Petty business has a very less percentage. Others include fuelwood collection for sale, driving,

cooking, laundering and livestock rearing. One important point in this table is that women have equal participation in all the economic activities except jobs. The reason for this is that majority of the jobs are given by Jindal and women have not received the same.

Table 3.3 Primary Economic Activities¹⁰ of Individuals

Economic Activities	Jindal Refinery Area			Jindal Mining Area			Anrak Refinery Area		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Agriculture	132 (38.94)	129 (38.05)	261 (76.99)	46 (34.07)	52 (38.52)	97 (71.85)	169 (43.22)	161 (41.18)	330 (84.40)
Farm Labour	11 (3.24)	16 (4.72)	27 (7.96)	15 (11.11)	14 (10.37)	29 (21.48)	0	0	0
Wage Labour	11 (3.24)	10 (2.95)	21 (6.19)	0	0	0	15 (3.84)	18 (4.60)	31 (7.93)
Job	19 (5.60)	0 (0.00)	19 (5.60)	6 (4.44)	3 (2.22)	9 (6.67)	1 (0.26)	2 (0.51)	3 (0.77)
Petty Business	0 (0.00)	2 (0.59)	2 (0.59)	0	0	0	3 (0.77)	3 (0.77)	6 (1.53)
Others	4 (1.18)	5 (1.47)	6 (1.77)	0	0	0	13 (3.32)	6 (1.53)	19 (4.86)
Total	177 (52.21)	162 (47.79)	339 (100.00)	67 (49.63)	68 (50.37)	135 (100.00)	201 (51.41)	190 (48.59)	391 (100.00)

Source: Field Survey (2009)

In Jindal Mining area, the majority of the workforce is engaged in agriculture (71.85 percent), followed by farm labour and job. Non-farm labour work is absent here. Unlike Jindal Refinery area, the percentage of woman participation here is equal in all the economic activities including job. Agriculture plays an important part also in Anrak Refinery area (84.40 percent), followed by non-farm labour and others. Others include laundering, driving, fuelwood collection and livestock rearing. The percentage of job is very less here. Here also women have equal participation in most of the works.

¹⁰ Here primary activity is majority of time devoted to that particular economic activity.

Table 3.4 Secondary Economic Activities of Individuals

Economic Activities	Jindal Refinery Area			Jindal Mining Area			Anrak Refinery Area		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Agriculture	3 (1.17)	2 (0.78)	5 (1.95)	0	0	0	7 (2.11)	5 (1.51)	11 (3.32)
livestock	2 (0.78)	1 (0.39)	3 (1.17)	0	0	0	4 (1.21)	2 (0.60)	6 (1.81)
Wage Labour ¹¹	99 (38.67)	104 (40.63)	203 (79.30)	6 (4.69)	5 (3.91)	11 (8.59)	155 (46.83)	152 (45.92)	307 (92.75)
Job	7 (2.73)	0 (0.00)	7 (2.73)	6 (4.69)	0	6 (4.69)	2 (0.60)	0	2 (0.60)
Business	3 (1.17)	2 (0.78)	5 (1.95)	0	0	0	0	1 (0.30)	1 (0.30)
NTFP Collection	15 (5.86)	16 (6.25)	31 (12.11)	51 (39.84)	59 (46.09)	120 (93.75)	0	0	0
Others	1 (0.39)	1 (0.39)	2 (0.78)	1 (0.78)	0	1 (0.78)	3 (0.91)	0	3 (0.91)
Total	130 (50.78)	126 (49.22)	256 (100.00)	64 (50.00)	64 (50.00)	128 (100.00)	171 (51.66)	160 (48.34)	331 (100.00)

Source: Field Survey (2009)

A look at the secondary occupations show that in Jindal Refinery area, wage labour is the second major economic activity (nearly 80 percent) followed by NTFP collection. Here NTFP is fuel wood collection. Here also women have equal share in all the economic activities except job. All these jobs are given by Jindal and as now, they are getting only stipend; people take it as their secondary economic activity. In Jindal Mining area, NTFP collection is the second major economic activity (94 percent) followed by wage labour. Here also women have equal participation except for job. In Anrak Refinery area, wage labour is the secondary occupation (93 percent) followed by agriculture. Here also women have an equal role to play. This explains that in all the three study areas, women are equally active as their male counterparts. The next section shows that literacy rate is very low among women in all these three study areas. As a result, most of them do not have a job. However, they are playing a major role in all other economic activities.

¹¹ This includes both farm and non-farm labour.

3.3 Mining and Livelihood Assets

The livelihood approach is concerned first and foremost with people. According to this, people require a range of assets to achieve positive livelihood outcomes; no single category of assets, on its own, is sufficient to yield all the many and varied livelihood outcomes that people seek. The framework identifies five core asset categories or types of capital upon which livelihoods are built. The current understanding of poverty places considerable emphasis on ownership or access to assets that can be put to productive use as the building blocks by which the poor can construct their own routes out of poverty (Ellis and Mdoe 2003). Therefore, it is interesting to study the existing livelihoods of people, on the following five types of capital.

3.3.1 *Human Capital*

In the livelihood framework, human capital is taken as a livelihood asset, or as a means of achieving livelihood outcomes. It represents the skills, knowledge, ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives. Human capital is required to make use of any of the other four types of assets. Therefore, it is necessary, though not sufficient on its own, for the achievement of positive livelihood outcome. Many people regard ill health and/or lack of education as core dimensions of poverty and thus, overcoming these conditions may be one of their primary livelihood objectives (DFID 1999). Table 3.5 shows the educational status of the sample households and table 3.6 shows the status of health of people in the study areas.

The literacy rate is very low among women in all these three areas. Illiterate percentage varies from 57 percent to 64 percent (Table 3.5). Among men, it is 39 to 45 percent. Further the percentage of education in men is more than that of women in all categories, except in the primary education in Anrak Refinery area. The percentage of those educated above graduation is very low among women in both the refinery areas, and zero in Jindal Mining area. As Jindal Mining area, covers tribal hamlets in the forest area, the percentage of female illiteracy is comparatively high. However, the percentage of male illiteracy is much less in these areas. Both the refinery areas show a more or less same trend.

Table 3.5 Educational Status of Sample Households

Educational Status	Jindal Refinery		Jindal Mining		Anrak Refinery	
	Male	Female	Male	Female	Male	Female
Illiterate ^{12, 13}	40.23	60.96	38.46	63.64	44.30	56.68
Literate (non-formal)	0.38	1.20	0.96	1.01	2.93	2.28
Literate below primary	9.20	8.37	17.31	16.16	11.73	7.49
Primary	13.41	8.76	18.27	9.09	8.47	14.33
Middle	18.01	11.55	7.69	6.06	14.01	11.07
Secondary	10.34	7.17	12.5	4.04	13.68	6.51
Graduation and above	8.43	2.39	4.81	0.00	4.89	1.63
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Field Survey (2009)

Table 3.6 Status of Health of the People in Study Areas

Study Areas	Households facing Health Problems	Treatment Received
Jindal Refinery	22.46	100.00
Jindal Mining	84.31	95.35
Anrak Refinery	61.45	100.00

Source: Field Survey (2009)

¹² The working definition of literacy in the Indian census since 1991 is: the total percentage of the population of an area, at a particular time, aged seven years or above, who can read or write with understanding. Here the denominator is the population aged seven years or more. This study consider this definition.

¹³ According to the 2001 Census, the literacy rate of Vizianagaram District is 51.82%, with a male literacy rate of 63% and female literacy rate of 40.73%. The literacy rate of Visakhapatnam District is 59.45%, with a male literacy rate of 68.84% and female literacy rate of 49.99%. In case of rural areas only 35.21% and 36.78% of women are literate in both the districts respectively. AP has a total literacy rate of 61.11%, with 70.85% male literates and 51.17% female literates.

The percentage of households facing health problems is very high in Jindal Mining area (84.31 percent) followed by the households in Anrak Refinery area (61.45 percent). This percentage is 22.46 in Jindal Refinery area (Table 3.6). In both the refinery areas, all households are receiving treatment. However, in the mining area, two to three households have not received treatment. The reasons they cited are lack of money and no facilities near their village. In the mining area, the source of treatment is public (44 percent) followed by private (28 percent) and traditional (16 percent). However, in both the refinery areas, the main source of treatment is private (61 percent in Jindal Refinery and 73 percent in Anrak Refinery) followed by public (35 percent in Jindal Refinery and 24 percent in Anrak Refinery). Few households also have access to both private and public source of treatment.

3.3.2 Social Capital

In the context of the sustainable livelihood framework, social capital is taken to mean the resources upon which people draw in pursuit of their livelihood objectives. These are developed through networks and connectedness, membership of more formalized groups and relationships of trust, reciprocity and exchanges that facilitate co-operation, reduce transaction costs and may provide the basis for informal safety nets amongst the poor. They are all inter-related.

In all the study areas, 90 to 95 percent of sample households are members of Public Distribution System (PDS) (Table 3.7). The second highest membership is in Development of Women and Children in Rural Area (DWCRA). It varies from 59 to 67 percent. Old age pension takes a third place. In both the refinery areas, households' involvement in *Anganwadi* is very less. However, this is relatively higher in the mining areas. Most of the households stated that they have benefitted from the programmes and have not faced any difficulties. They are aware about the programmes in which they are members.

Table 3.7 Membership in Formal Institutions

Formal Institutions	Jindal Refinery	Jindal Mining	Anrak Refinery
PDS	95.65	90.20	93.98
DWCRA	62.32	58.82	67.47
<i>Anganwadi</i>	1.45	19.61	0.40
Old Age Pension	19.57	17.65	10.84

Source: Field Survey (2009)

Table 3.8 Trust in Lending and Borrowing

Study Areas	Trust		Trust in Matters of Lending and Borrowing			
	People can be trusted	Careful in dealing with people	Do trust	Do not trust	Do not know/not sure	No answer
Jindal Refinery	24.26	75.74	61.59	37.68	0.72	0.00
Jindal Mining	58.82	41.18	82.35	3.92	13.73	0.00
Anrak Refinery	86.67	13.33	89.70	9.70	0.61	0.00

Source: Field Survey (2009)

Majority of the people in Jindal Mining area and Anrak Refinery area believe that most people can be trusted (Table 3.8). However, in Jindal Refinery area, people are too careful in dealing with other people. In terms of trust in lending and borrowing, they are comparatively better. In the other two areas, the people greatly trust others in matters of lending and borrowing.

3.3.3 Natural Capital

Natural capital can be defined as the stock of natural resources and environmental assets, including water, soils, air, flora, fauna, minerals and other natural resources. For rural people, natural capital is very important because they derive all or part of their livelihoods from farming, fishing and collecting forest products.

All the study areas are naturally very rich. In Jindal Mining area, all the households have agricultural land. Nearly 94 percent of them are practicing *podu* and 33 percent are using forest land for cultivation. All households except a few are collecting NTFP from forests. However, their income from NTFP collection is not a major source, and agriculture is the major source of income. In both the refinery areas also most of the households have agricultural land. They do not practice *podu*. In Jindal Refinery area, few households (2.90 percent) use forest land for agricultural purpose. As the forest is close to their village, they collect fuelwood from the forest and sell it. This percentage is nil in Anrak Refinery area as they do not have any nearby forest. As majority of the households in all the study areas have agricultural land, it is important to know the size-class distribution of the households¹⁴.

¹⁴ Large Farmers (>10 acres), Medium Farmers (5.1 to 9.9 acres), Small Farmers (2.51 to 5 acres), Marginal Farmers (0.1 to 2.5 acres), Landless (0 acres).

Table 3.9 Access to Natural Capital

Study Areas	HHs having Agricultural Land	HHs using Forest Land	HHs Practicing <i>Podu</i>	HHs Collecting NTFP
Jindal Refinery	86.96	2.90	0.00	13.77
Jindal Mining	100.00	33.33	94.12	98.03
Anrak Refinery	90.36	0.00	0.00	0.00

Source: Field Survey (2009)

Table 3.10 Landholding in Sample Villages (% of Households)

Study Area	Large Farmers (%)	Medium Farmers (%)	Small Farmers (%)	Marginal Farmers (%)	Landless (%)	Total HHs
Jindal Refinery	1 (0.72)	15 (10.87)	30 (21.74)	74 (53.62)	18 (13.04)	138 (100.00)
Jindal Mining	16 (33.33)	18 (35.29)	14 (27.45)	2 (3.92)	0 (0.00)	51 (100.00)
Anrak Refinery	0 (0.00)	0 (0.00)	11 (6.63)	139 (83.73)	16 (9.64)	166 (100.00)

Source: Field Survey (2009)

In Jindal Mining area, all the households have agricultural land. The percentage of medium farmers is highest (35.29 percent), followed by large farmers (33.33 percent) and small farmers (27.45 percent). Therefore, their income from agriculture is also very high unlike the refinery areas, where the primary source of income is wage labour. Marginal farmers have a very less percentage (3.92 percent). In both the refinery areas, the percentage of marginal farmers is the highest. In Anrak Refinery area, not a single sample household has agricultural land more than 5 acres. Even small farmers have a very less percentage (6.63 percent). In Jindal Refinery area, this percentage is comparatively higher (21.74 percent). They also have a few medium farmers and a single large farmer.

Table 3.11 Important Common Property Resources (CPRs)

Study Area	Jindal Refinery	Jindal Mining	Anrak Refinery
Major CPRs	Pond, Tamarind, Fuel wood	Pond, Canal, Tamarind, Mango, <i>Amla</i> ¹⁵ , Jackfruits, <i>Karaka</i> ¹⁶ , Ginger, Broomsticks, Honey, <i>Shikakai</i> , Bamboo, Soapnut, <i>Jeelugu</i> , Cashew,	Pond, Canal, Tamarind

Source: Field Survey (2009)

In both refinery areas, pond and tamarind are the major CPRs. Villages use the pond water for agricultural purpose and also for bathing and washing. Tamarind is used for household consumption and for selling. In Jindal Refinery area the people also collect fuelwood for daily cooking purposes, and they sell a part of it. In Anrak Refinery area, they have canals and they use that water for agricultural purposes. On the other hand, as Jindal Mining is in a forest area, people have access to a number of NTFPs (Table 3.11). They use them both for consumption and selling purposes.

In Jindal Refinery area, surface water is the major source of drinking water followed by piped water (Table 3.12). Some households use both (14.39 percent). In Anrak Refinery area, tube well is the major source of drinking water followed by surface water and a combination of piped water and tube well. However, in Jindal Mining area, they are dependent on streams. Majority of the households use a combination of piped water and streams, followed by only streams.

3.3.4 Physical Capital

Physical capital comprises the basic infrastructure and producer goods needed to support livelihoods. The components of infrastructure which are usually essential for sustainable livelihoods are: affordable transport; secure shelter and building; adequate water supply and sanitation; clean, affordable energy; and access to information. Infrastructure such as roads, rails and telecommunications are important for the integration of the remote areas where many of the poor live.

¹⁵ *Indian gooseberry (Emblica officinalis)*

¹⁶ *(Corynocarpus laevigatus)*

Table 3.12 Sources of Drinking Water

Sources	Jindal Refinery	Sources	Jindal Mining	Sources	Anrak Refinery
Surface Water	50.76	Piped Water & Streams	43.14	Tube Well	66.07
Piped Water	21.21	Streams	33.33	Surface Water	15.48
Piped & Surface	14.39	Piped Water & Open Well	9.80	Tube Well & Piped	7.74
Tube Well	5.31	Others	13.78	Piped Water	4.76
Surface & Open Well	5.30	-	-	Tube Well, Open Well & Lake	3.59
Open Well	3.03	-	-	-	-
Total	100.00	-	100.00	-	100.00

Source: Field Survey (2009)

Table 3.13 Housing Status in Study Area

Study Areas	HHs owning a House (%)	Type of House			Number of Rooms		
		Thatched	Pucca	Semi Pucca	1	2	> 2
Jindal Refinery	97.83	34.07	4.44	61.48	67.39	13.77	18.12
Jindal Mining	100.00	9.80	84.31	5.88	50.98	47.06	1.96
Anrak Refinery	100.00	16.3	31.3	52.4	37.3	50.6	11.8

Source: Field Survey (2009)

Most of the sample households own a house except a few households in Jindal Refinery area who live in rented houses (Table 3.13). In the refinery areas, many households are *pucca* as they were constructed after getting compensation from the companies. In the mining villages, the majority households have semi-*pucca* houses. In all the houses, the number of rooms varies between one and two. Only in the refinery areas, a few households have more than two rooms. Apart from house, the households have also other physical assets (Table 3.14). In both the refinery areas, many households have cycle, fan, watch, *almirah* and TV. In Jindal Mining area, all the households have agricultural assets. This percentage is also high in Anrak Refinery area (65.66 percent). However, in Jindal Refinery area, the households do not have agricultural assets.

Table 3.14 Physical Assets

Particulars	Jindal Refinery		Jindal Mining		Anrak Refinery	
	% of HHs	Present Value (Rs.)	% of HHs	Present Value (Rs.)	% of HHs	Present Value (Rs.)
Cycle	36.96	75,850	0.00	0.00	50.00	2,62,206
Fan	44.93	61,950	5.88	2,800	64.46	1,31,400
Watch	19.57	3,900	25.49	5,050	43.98	13,715
<i>Almirah</i>	18.12	59,200	5.88	10,000	24.70	1,28,750
TV	39.86	3,25,100	21.57	94,600	29.52	4,24,600
Motorcycle	7.97	3,11,000	1.96	35,000	6.63	9,88,500
Fridge	0.72	7,000	0.00	0.00	4.82	1,60,000
Agricultural Assets	1.45	6,10,000	100.00	75,970	65.66	96,200

Source: Field Survey (2009)

3.3.5 Financial Capital

Financial capital denotes the stocks and flows of financial resources that people use to achieve their livelihood objectives. There are two main sources of financial capital. They are available stocks and regular inflows of money. Savings are the preferred type of financial capital. They can be held in several forms like cash, bank deposits or liquid assets such as livestock and jewellery. Financial resources can also be obtained through credit providing institutions. Regular inflows of money include pensions, or other transfers from the state, and remittances.

Table 3.15 Mean Household Income of Villages

Study Areas	Mean HH Income (Rs.)	Mean Per capita Income (Rs.)	Mean HH size (No.)
Jindal Refinery	52214.49	13343.70	3.91
Jindal Mining	61708.63	14176.31	4.35
Anrak Refinery	44860.58	11493.78	3.90

Source: Field Survey (2009)

Table 3.16 The Herfindahl Index for Income Diversification

Study Areas	Herfindahl Index	Diversification
Jindal Refinery	0.33	0.66
Jindal Mining	0.30	0.69
Anrak Refinery	0.38	0.61

Source: Field Survey (2009)

The mean household income and mean per capita income is very high in the mining areas (Table 3.15). As all the households have agricultural land, practicing *podu*, collecting NTFP, and three months of regular wage labour job in the coffee estate increases their income. On the contrary, in the refinery areas, many of them are small farmers and majority of their income comes from wage labour. The mean household size is small in the refinery areas compared to the mining areas. With the help of Herfindahl Index, income diversification is calculated (Table 3.16).

It is seen that the households of Jindal Mining area have highly diversified livelihoods, followed by Jindal Refinery and Anrak Refinery. On an average, all the three areas have diversified source of income and not a single occupation plays a monopoly role.

In all the three study areas, majority of monthly expenditure goes to food (65 to 76 percent) followed by health and adult education (Table 3.17). However, the difference between expenditure on food and health expenditure is very high. Children education, travel for work, travel for education and recreation have a very small percentage. As the major percentage of household expenditure is going to food, it is important to know whether the households have food security or not (Table 3.18).

Table 3.17 Household Expenditure (Percentage)

Study Areas	Food	Children Edu.	Adult Edu.	Travel for work	Travel for Edu.	Health	Recreation	Other	Total
Jindal Refinery	76.18	1.91	5.70	0.55	0.99	7.34	2.95	4.38	100.00
Jindal Mining	64.64	1.31	4.74	0.76	0.85	7.11	5.47	15.12	100.00
Anrak Refinery	74.25	2.66	5.01	1.80	1.42	7.55	2.25	5.06	100.00

Source: Field Survey (2009)

Table 3.18 Food Security¹⁷

Study Area	< 3 Months (%)	3-6 Months	6-9 Months	9-12 Months	>12 (surplus to sell)	No Food Security	Total
Jindal Refinery	8 (5.80)	6 (4.35)	12 (8.70)	30 (21.74)	1 (0.72)	81 (58.70)	138 (100.00)
Jindal Mining	0 (0.00)	1 (2.00)	12 (23.5)	34 (66.7)	4 (7.8)	0 (0.0)	51 (100.00)
Anrak Refinery	6 (3.61)	27 (16.27)	40 (24.10)	45 (27.11)	13 (9.03)	33 (19.88)	166 (100.00)

Source: Field Survey (2009)

In Jindal Refinery area, more than half of the households do not have food security (Table 3.18). Only 22 percent of households have food security for nine to twelve months. As most of the farmers are marginal, they do not have enough crop produce from their field. Income from wage labour is the remaining important option for them. In Jindal Mining area, most of the households have food security from nine to twelve months. In Anrak Refinery area, twenty percent of the households do not have food security. Many of them have three to twelve months of food security.

¹⁷ Food security refers to the availability of food and one's access to it. A household is considered food secure when its occupants do not live in hunger and fear of starvation.

Table 3.19 Ownership Distribution by Households of Selected Livestock

Ownership Range	Study Locations		
	Jindal Refinery	Jindal Mining	Anrak Refinery
Cattle			
0	85.51	33.33	92.77
1-5	13.77	50.98	7.23
More than 5	0.72	15.69	0.00
Buffaloes			
0	84.78	90.20	40.96
1-5	14.49	9.80	59.04
More than 5	0.72	0.00	0.00
Goats			
0	97.83	62.75	96.39
1-5	0.72	35.29	2.41
More than 5	1.45	1.96	1.20
Sheep			
0	98.55	84.31	98.19
1-5	1.45	9.80	0.00
More than 5	0.00	5.88	1.81
Poultry			
0	99.28	9.80	89.16
1-5	0.00	52.94	6.02
More than 5	0.72	35.29	4.82

Source: Field Survey (2009)

The patterns of livestock holding found in the three areas are shown in Table 3.19. In the refinery areas, relatively few households own cattle, goats, sheep and poultry. In Anrak Refinery area, nearly 60 percent of the households have buffaloes. In Jindal Refinery area, for all the households, the percentage of livestock ownership is very less. In the mining area, the percentage of livestock holding is high (except buffaloes and sheep). Almost all the households have poultry. In the study areas, especially in refinery areas, as the households are not food secure, they do not have enough livestock, they borrow in order to cope with their situation. Table 3.20 shows the borrowing situation in the study areas.

Table 3.20 Sources of Borrowing (Percentage of Households)

Sources	Jindal Refinery	Jindal Mining	Anrak Refinery
Self Help Groups (SHGs)	46.67	25.00	50.49
Bank and SHGs	22.67	0.00	6.80
Private Lenders and SHGs	0.00	0.00	16.50
Bank	16.00	0.00	6.80
Private Lenders	8.00	75.00	8.74
Others	6.66	0.00	10.67
Total	100.00	100.00	100.00
Households having debt	52.17	35.29	58.79
Households Borrowed over the last one year	54.35	15.69	65.06

Source: Field Survey (2009)

As the mean household income is less in the refinery areas, the percentage of households having debt and the percentage of households borrowed over last one year is high in both the places. In the mining area, this percentage is comparatively less. In Jindal Refinery area, the major source of borrowing is from Self Help Groups (SHGs) followed by both bank and SHGs, and only bank. In Anrak Refinery area, the primary source is SHGs, followed by a combination of private lenders and SHGs, and private lenders. However, in the mining area, the majority of the borrowing (75 percent) is from private lenders followed by SHGs (25 percent). In Jindal Refinery area, the majority of the borrowings are for agricultural purpose and household expenditure. In Jindal Mining area, it is purchase of residential land or building. In Anrak area, it is for agricultural purpose followed by purchase of residential land or building, debt repayment, non-farm business, medical purpose and marriage.

3.4 Conclusion

As the previous section shows, the households in the refinery areas are not rich in any other form of capital except natural capital. Most of the households have agricultural land and their livelihoods revolve around that piece of land. As income from agriculture is not enough, they work as wage labour. In spite of that, they do not have food security for most of the year. They are illiterate and without any skill. Once the refinery starts

and these people are displaced what will happen¹⁸? Definitely all of them will not be absorbed by the company. Cash compensation will go for a year or two. What is the next step? This will result in migration, which is not a permanent solution. Will the company do something to help the people to cope with this situation? These are some unanswered questions.

The situation in Jindal Mining area is different. Here all the households have agricultural land, their primary income is from agriculture and they have food security for a year. This is a forest area and people collect and sell NTFP to add to their household income. They are comparatively rich in all forms of capital. Land acquisition has not started in this area. However, once it starts where will these people go? They will lose their agricultural land and the forest will be destroyed. The streams will get dry. What will be their new source of livelihoods?

Uprooting people in the name of development is going on everywhere. These people are voice less and they lose everything. Only the concerned company with the help of the government should try their best to help them to cope with this and start a new livelihood, which should be sustainable. Only time will decide if bauxite mining and alumina refinery will bring a sustainable livelihood to the people of Andhra Pradesh.

¹⁸ Land acquisition has started in both the refinery area, the next chapter discusses this.

CHAPTER - 4

BAUXITE MINING AND DISPLACEMENT

4.1 Mining Induced Displacement

Mining-Induced Displacement and Resettlement (MIDR) poses major risk to sustainable development (Downing 2002). Cernea (2000) defined **displacement** as not only the physical eviction from a dwelling, but also the expropriation of productive lands and other assets to make possible an alternative use. Asian Development Bank (1998) defined **Affected People** as those who stand to lose, as a consequence of a project, all or part of their physical and non-physical assets, including homes; communities; productive lands; resources such as forests, rangelands, fishing areas, or important cultural sites; commercial properties; tenancy; income-earning opportunities; and social and cultural networks and activities. **Rehabilitation** refers to restoring the incomes, livelihoods and social systems of the displaced to at least the level of their pre-project status.

The development-induced displacement literature on mining is small compared to dam and other development projects. Stanley (2004) has given two reasons for this. Firstly, mining causes limited displacement compared to large infrastructure projects. Secondly, the displacement caused by such projects is often indirect; therefore, they are less examined in the literature. Downing (2002) report offers an overview of mining-induced displacement and rehabilitation issues, and also suggests ways to prevent the impoverishment of the displaced people.

No global survey has assessed the scale of MIDR (Downing 2002). Cases are highly visible in Papua New Guinea, Indonesia, Philippines, Peru, Venezuela, Suriname, Guyana, Argentina, Chile, Honduras, Tanzania, Botswana and Namibia. According to Downing (2002), mining displaced 2.55 million people in India between 1950 and 1990. The displacement may increase to a large extent as national mining policies are liberalized; as companies opt for open-cast mining, and as the rural population density increases (Downing, 2002). Mining projects, particularly coal, have been among the biggest displacing agents in India. The Major coal companies displaced as many as 32,751 families in 1981-85; and Singrauli has displaced about 50,000. Until the 1960s, focus

was on underground mines, due to which there were Project Affected Persons (PAPs), but relatively few Displaced Persons (DPs). Displacement by coal mines has now increased because with the rise in the demand for low grade coal for thermal plants and the need to raise its production rapidly, the focus since 1970 has been on opencast mines; these displace a large number of people (Murican et al, 2003).

In displacement literature, the potential risks threatening sustainability are: joblessness, homelessness, marginalization, food security, loss of common lands and resources, increased health risks, social destruction (Cernea 1998), loss of civil and human rights (Downing 1998) disruption of formal educational activities and loss of access to basic public services (Mathur and Marsden 1998).

In case of bauxite mining in Andhra Pradesh, displacement has not yet started in both Jindal and Anrak mining areas. However, in the refinery areas, it has started since the year 2007. The main objective of this chapter is to understand the displacement scenario in Jindal and Anrak refinery areas, the Resettlement and Rehabilitation (R and R) packages given by both the companies, and to study communities' perception of the same.

4.2 Land Requirement of Jindal and Anrak¹⁹

According to the Environmental Impact Assessment (EIA) Report of Jindal, the total land requirement for the proposed project is estimated to be around 545 ha (1350 acres). According to the report, only 15 percent of the total land is private land (Table 4.1). The report says that all attempts were made to reduce the extent of private land. However, some acquisition of private land has become unavoidable as they lie in between the government lands. According to the EIA Report of Anrak Alumina Limited (AAL), they have identified 560 ha for locating the plant. Here, the percentage of government land is very less (6.5) and private land is very high (93.5) (Table 4.1).

According to information from the District Revenue Officer, Vizianagaram, the authorities of M/s Jindal South West Aluminum Limited., Visakhapatnam, have submitted a requisition for alienation of land measuring 1127.76 acres in Musidipalli, Cheedipalem, Chinakandepalli, MB Vara and Kiltampalem villages of S. Kota Mandal for establishment of 1.4 million TPY Alumina Refinery Complexes²⁰.

¹⁹ As land acquisition has not yet started in the mining areas, this chapter concentrates only on the refinery areas of Jindal and Anrak.

²⁰ We do not have the same information from the District Revenue Officer of Visakhapatnam District for the refinery complex of Anrak.

Table 4.1 Land Requirement of Jindal and Anrak Refinery

Jindal Particulars	Area (Acres)	Anrak Particulars	Area (Ha)
Alumina Refinery and Co-generation (including storages and green belt)	750	Alumina Refinery	200
Residue Disposal Area and Ash Pond	500	Red Mud Pond	80
Township and			
Miscellaneous	50	Aluminum Smelter	90
Railway Lines	50	Secured Land fill for SPL	30
Total	1350	Co-generation Plant	40
		Green Belt	80
		Roads and Infrastructure	40
		Total	560
Private Land	170 (15)	Private Land	523 (93.5)
Government Land	1180 (85)	Government Land	37 (6.5)

Source: Environmental Impact Assessment Report (2007)

Note: Figures in parentheses shows percentage to total.

Table 4.2 Land Details given by JSW

Name of the Village	Government Land Proposed			Assigned D. Patta lands proposed	Total
	Dry	Wet	Total		
Musidipalli	23.57	—	23.57	34.78	58.35
Cheedipalem	33.38	—	33.38	135.47	168.85
Chinakandepalli	29.71	22.53	52.24	136.62	188.85
M.B. Vara	54.73	22.72	77.45	253.05	330.50
Kilthampalem	10.73	11.17	21.90	359.30	381.20
Total	152.12	56.42	208.54	919.22	1127.76

Source: District Revenue Office, Vizianagaram (2008)

The Spl. C.S. and Chief Commissioner of Land Administration (CCLA), Hyderabad, in his letter dated 26.2.2007, stated that “In principle, allocation of the land for the project by the Government is possible at this stage. However, the actual alienation will have to be based on detailed examination of the lands item wise, its legal position and modalities; and certain bits may have to be excluded due to Supreme Court guidelines on alienation of the tank bed lands, etc.” Finally, the government has sanctioned 1017.71 acres to JSW Limited for their refinery²¹.

Table 4.3 Final Land given to Jindal

Name of the Village	Government Land Proposed			Assigned D. Patta lands proposed	Total
	Dry	Wet	Total		
Musidipalli	23.57	0	23.57	34.78	58.35
Cheedipalem	33.38	0	33.38	135.47	168.85
Chinakandepalli	29.71	0	29.71	84.07	113.78
M.B. Vara	53.15	0	53.15	253.05	306.2
Kilthampalem	10.41	0.82	11.23	359.30	370.53
Total	150.22	0.82	151.04	866.67	1017.71

Source: District Revenue Office, Vizianagaram (2008)

4.3 Asset Acquisition in the Sample Villages

In the Jindal Refinery Area, out of the 138 sample households, 83 households (60.14 percent) are affected. Almost all the households except one lost their recorded cultivated land. The percentage of other assets such as homestead land and trees is very less. None of the sample households lost their house, cattle shed or open well. In Anrak refinery area, out of the 166 households, 153 (92.17 percent) of the households are affected. Nearly 90 percent of them lost their recorded cultivated land. Half of the affected households (52.94 percent) lost their cattle shed. The percentage of affected households losing trees (49.67 percent), homestead land (31.37 percent), house (18.95 percent) and open well (15.69 percent) is also high. Percentage of households losing homestead land is very less compared to the percentage of households losing cultivated land. The pattern seems clear that the authorities want to minimize the acquisition of

²¹ They have kept making various changes to this even though it was claimed to be the final land proposed for Jindal.

household land. The AP R&R Policy gives land for land in the plain area if household land is acquired. In tribal areas land for land is given if any land is acquired. So a good tactic for the authorities is to cut down on household land acquired in the plain area and they do not have to bother about rehabilitation.

Table 4.4 Details of Asset Acquisition

Category of Assets	Jindal Refinery	Anrak Refinery
Recorded Cultivated Land	82 (98.80)	138 (90.20)
Recorded Homestead Land	3 (3.61)	48 (31.37)
Encroached Government Land	8 (9.64)	4 (2.61)
House	0	29 (18.95)
Cattle shed	0	81 (52.94)
Open Well	0	24 (15.69)
Trees	5 (6.02)	76 (49.67)
Total affected Households	83 (100.00)	153

Source: Field Survey (2009)

Notes: This table will not add up to hundred as there are few households who have lost more than one asset.

The percentage of households losing their cultivated land is very high in both the study areas (Table 4.4). Expropriation of land removes the main foundation upon which people's productive systems, commercial activities and livelihoods are constructed. This is the principal form of recapitalization and pauperization of displaced people through loss of both physical and man-made capital (Cernea 1997). For analyzing the nature of landholding in both pre and post displacement stages, legal landholding was taken as the sole variable. After land acquisition, the percentage of households with land reduced drastically in both refinery areas (Table 4.5). The average legal land holding of the displaced people also reduced in both the areas. The percentage change in total area and the average size is also seen to be negative. Therefore, it is concluded that there is a drastic change in the land system of the affected households.

Table 4.5 Landholding of Sample Households in the Refinery Area

Area	Total No of HH	No of HH with Land (in acre)				Average Area		Per Cent Change in	
		Before		After		Before	After	Total Area	Average Size
		Number	Area	Number	Area				
Jindal Refinery	138 (100.00)	120 (86.96)	324.83	75 (54.35)	160.94	2.70	2.14	-50.45	-20.74
Anrak Refinery	166 (100.00)	150 (90.36)	179.51	28 (16.87)	28.00	1.19	1.00	-84.40	-15.96

Source: Field Survey (2009)

This can be further supported by another explanation – by taking changes in land of different size-class households into consideration. Here, all the households are classified into five different economic classes based completely on their landholdings. A detailed analysis of changes in land of different size-class households is given in table 4.6. It shows the total land possessed by various categories of households before and after displacement. It is observed that the percentage of landless households increased drastically in both the refinery areas. Similarly the percentage of marginal, small and medium farmers has reduced. It is also observed that the percentage of large farmers is very insignificant in both the areas, and remains the same. In the absence of a land for land policy, the landholding of the people has drastically reduced.

4.4 Compensation Package of Jindal and Anrak

The usual approach to involuntary displacements has been to offer compensation to the displaced. It is based on the value of the land at the time of notification, which is much smaller than the value at the time of dispossession. Further, because of intervention from middle men, the amount of money that reaches the disposed is lesser than the price of replacement land (Nathan 2009). Jindal and Anrak both have different compensation packages for the affected people (Table 4.7).

It is seen that both the companies are offering monetary compensation for the agricultural land acquired. In case of Jindal, the compensation amount is Rs. 2,00,500, while Anrak gives Rs. 4,05,000. Affected households are promised one job per *patta*. Other compensations include a share in the company in case of Jindal area, while Anrak has promised to give a ration card and two milch animals. For recorded homestead land and house, Jindal has given monetary compensation, while Anrak has promised them to give a resettlement colony. For cattle shed, Jindal is giving money, whereas Anrak has promised land. For open wells and trees, both the companies are giving monetary compensation.

Table 4.6 Change in Land of Different Size-Class Household

Area	Household Category	Before Displacement				After Displacement			
		No. of HHs	Percent Share of Total	Area (acre)	Percent Share of Total	No. of HHs	Percent Share of Total	Area (acre)	Percent Share of Total
Jindal Refinery	Landless	18 (13.04)	Nil	Nil	Nil	63 (45.65)	Nil	Nil	Nil
	Marginal Farmers	74 (53.62)	61.67	109.56	33.73	55 (39.86)	73.33	75.23	46.74
	Small Farmers	30 (21.74)	25	106.61	32.82	17 (12.32)	22.67	58.39	36.28
	Medium Farmers	15 (10.87)	12.5	93.66	28.83	2 (1.45)	2.67	12.32	7.66
	Large Farmers	1 (0.72)	0.83	15.00	4.62	1 (0.72)	1.33	15	9.32
	Households with land	120 (86.96)	100	324.83	100	75 (54.35)	100	160.94	100
	Total Households	138 (100.00)	-	-	-	138 (100.00)	-	-	-
Anrak Refinery	Landless	16 (9.64)	Nil	Nil	Nil	138 (83.13)	Nil	Nil	Nil
	Marginal Farmers	139 (83.73)	92.67	138.81	77.33	25 (15.06)	82.29	17.68	63.14
	Small Farmers	11 (6.63)	7.33	40.7	22.67	3 (1.81)	10.71	10.32	36.86
	Medium Farmers	0	0	0	0	0	0	0	0
	Large Farmers	0	0	0	0	0	0	0	0
	Households with land	150 (90.36)	100	181.27	100	28 (16.87)	100	28	100
	Total Households	166 (100.00)	-	-	-	166 (100.00)	-	-	-

Source: Field Survey (2009)

Table 4.7 Details of Compensation Package

Category of Assets	Jindal Refinery	Anrak Refinery
1 Acre of Land	Rs 2,00,500	Rs 4,05,000
	1 job	1 job
	Share in the company	Ration card, two milch animals
Recorded Homestead Land	Money	Resettlement colony
House	Money	Resettlement colony
Cattle Shed	Money	Land
Open Well	Money	Money
Trees	Money	Money

Source: Field Survey (2009)

In Jindal Refinery Area, most of the households (90.24 percent) have received monetary compensation for their recorded cultivated land. Those who have not received are either still fighting against land acquisition or waiting for money. Nearly half of the households (48.78 percent) were promised a job in the company. All of them are trained in a technical institute in Orissa for six months, and are presently receiving a stipend of Rs. 2,200 per month. They will get their job once the company starts working. This form of compensation is criticized most of the time. According to Nathan (2009), in mines and mineral-related industries, many jobs cannot be given to former agriculturists as they are semi-educated and low-skilled. However, the likelihood of getting such a job is termed as “a bargaining chip”, in order to get agreement from the displaced people (World Bank 1996). “Land for Land” is another possibility for recreating the livelihoods of agriculturists. However, most of the time agricultural land is not available for this purpose (Nathan 2009).

As in Jindal area the people are not much educated, most of the work involved mechanics, electricians or gardeners (Table 4.8). Some people (23.17 percent) did not want a job. Instead, they have taken a financial grant of Rs. 3, 00,000 per family. Others (28.05 percent) have not received anything; most of them are waiting for a job. Households with encroached government land have not received any compensation. According to the compensation package of Jindal, ex-gratia will be provided on par with government land for encroachment which is at least five years old, as certified by the revenue officials. Only two households have the same, and thus received monetary compensation for

their encroached land. Compensation for the acquisition of homestead land is yet to be given. In our sample households, none of them have lost house, cattle shed or open well. Monetary compensation for trees is also yet to be given. The company has promised to give a share in the company to each affected household. However, no one knows the reality.

Table 4.8 Received Compensation (Jindal)

Category of Assets	No. of HHs	Monetary Compensation		Job	Cash for Job	Not Received
		Received	Not received			
Recorded Cultivated Land	82	74 (90.24)	9 (9.76)	40 (48.78)	19 (23.17)	23 (28.05)
Recorded Homestead Land	3	0	3	NA	NA	NA
Encroached Government Land	8	2	6	NA	NA	NA
House	0	-	-	NA	NA	NA
Cattle Shed	0	-	-	NA	NA	NA
Open Well	0	-	-	NA	NA	NA
Trees	5	0	5	NA	NA	NA

Source: Field Survey (2009)

Table 4.9 Received Compensation (Anrak)

Category of Assets	No. of HHs	Monetary Compensation		Job	Not Received
		Received	Not received		
Recorded Cultivated Land	138	136	2	0	138
Recorded Homestead Land	48	1	47	NA	NA
Encroached Government Land	0	-	-	-	-
House	29	3	26	NA	NA
Cattle Shed	81	68	13	NA	NA
Open Well	24	21	3	NA	NA
Trees	76	71	7	NA	NA

Source: Field Survey (2009)

In case of Anrak Refinery, almost all households except two have received monetary compensation (Table 4.9). None of them have taken compensation for their homestead land and house, except a few. Here, people are asking for a rehabilitation colony with all infrastructures, which Anrak has agreed to give. Most of them have received monetary compensation for their trees, cattle sheds and open wells. Anrak has also promised job, a ration card and two milch animals, which is not yet fulfilled.

As the affected households in both the refinery areas have received monetary compensation, it is interesting to study how the affected households spend their compensation money (Table 4.10). In Jindal Refinery area, majority of the households (46.48 percent) have deposited a part of the money in bank. The second highest preference (45.07 percent) was for construction of house, while the third highest was debt clearance (35.21 percent). They also spent the compensation money in unproductive expenses such as household consumption (29.58 percent), marriage (19.72 percent), purchase of vehicles (5.63 percent) and ornaments (2.82 percent). Very few spent on productive expenses such as purchase of agricultural land (2.82 percent).

Table 4.10 Spending of Compensation details by the Affected Households

Sl. No	Type of Use	Number of Households (percentage)	
		Jindal Refinery	Anrak Refinery
1	Purchase of Agricultural Land	2 (2.82)	18 (10.84)
2	Purchase of Homestead Land	0 (0.00)	0 (0.00)
3	Purchase of House	0 (0.00)	0 (0.00)
4	Land Development	1 (1.41)	9 (5.42)
5	Construction of House	32 (45.07)	31 (18.67)
6	Household Consumption	21 (29.58)	39 (23.45)
7	Marriage	14 (19.72)	33 (19.88)
8	Purchase of Vehicles	4 (5.63)	3 (1.81)
9	Deposit in Bank	33 (46.48)	111 (66.87)
10	Health	3 (4.23)	9 (5.42)
11	Education		4 (2.41)
12	Debt Clearance	25 (35.21)	81 (48.80)
13	Purchase of Ornaments	2 (2.82)	0 (0.00)
14	Purchase of Livestock	0 (0.00)	1 (0.60)
15	Purchase of other durable Assets	0 (0.00)	0 (0.00)

Source: Field Survey (2009)

Notes: This table will not add up to hundred because of multiple responses

In Anrak Refinery area also the majority (66.87 percent) deposited their compensation money in banks. This is followed by debt clearance (48.80 percent) and household consumption (23.45 percent). Here also marriage and construction of house have an important percentage. Unlike in Jindal, some households here have purchased agricultural land (10.84 percent). Very few spent on education, purchase of livestock and other durable assets.

In all these villages, the people have a mixed perception towards the compensation policy. Villagers in the Jindal Refinery area are comparatively more satisfied than those in Anrak Refinery area. In Jindal Refinery area, people supporting the cash compensation are those whose agricultural land is in the rain fed area. Those with irrigation facilities are opposing the same. Opposition from tribals is more than from non-tribals. Some non-tribal villagers expressed that they are happy with the compensation money and have started petty business with the same. However, the villagers have not received full compensation because of middle men intervention. Getting a job in the company has made people more satisfied.

The situation in Anrak Refinery area is different. In all the three villages, the villagers are not happy with the compensation because though they have received compensation money, employment was not provided to each household as promised. The people complained that now they neither have agricultural land nor wage labour work. Although Anrak construction work has started, they are hiring outsiders to do the manual work. The villagers are surviving with livestock and the compensation money. What lies ahead is a bleak future?

4.5 Conclusion

There are three possible strategies with different outcomes that have been followed by mining companies in cooperation with governments (Downing, 2002). The first is to displace the population without concern for the people. The second strategy is to compensate or rehabilitate the people to a new location. The third strategy is to ensure that livelihoods and social systems are restored and that the affected people are better off in the post-project period (Downing, 2002). Although difficult, the third strategy will lead to sustainable mineral development.

Land is an asset that provides food and livelihood to the people. It enables them to utilize the major and sometimes the only skill that they possess – working on the land. It can be passed on to the next generation and hence provides security to several generations and lastly, it is marketable and in times of distress, serves as collateral. The only economic opportunity the landless have in rural India is to work on other people's land.

Displacement results in more wage conflict and the process is filled with uncertainty and greater vulnerability. They do not know where to invest the capital so that it produces an income stream for them that was at least comparable to what they got earlier. Cash compensation is seen to lead to unproductive expenditure and tragically to feminization of poverty. Hence, cash compensation is a complete lack of understanding of the livelihood relations that people have with their land (Venkateswaran 2007).

Land for land is a possibility. However, it adversely affects the “social capital” that existed between people in the same village. Invest in re-skilling the people so that they can be employed is an option. Another option is not to sell the land but to lease it to the company and to draw a regular income from the lease rent. Giving displaced people a share in the profits of the company is another option. Though these options are not perfect, a combination of them may provide some answers to this question (Venkateswaran 2007).

Workers of NALCO protested against the privatization plan of the Government of India. As the outsees who got jobs are the lowest rank holders in the company, they would be the first victims of privatization. In the beginning of the 1980s, when public sector mining companies went for mechanization and modernization, the tribals who had left their land to allow for mining activities were the first to lose their jobs. They became completely impoverished (Sarangi 2004).

Sustainable development is ensuring a better quality of life for the present and future generations. Therefore, policies must be developed to promote the social dimension of development and not just the economic and environmental dimensions. A cost-benefit analysis of all mining projects should be carried out, taking into consideration all the social costs of mining, which the near-by communities are bearing in the form of externality. The State Government should follow the Samata Judgement. All the stakeholders including the community should participate in the discussion. The government should also protect the tribals and their rights. A proper rehabilitation policy for the mining sector is the need of the hour.

CHAPTER - 5

SUMMARY AND CONCLUSION

5.1 Introduction

According to the Geological Survey of India, bauxite deposits of Andhra Pradesh (AP) and Orissa, referred as the East Coast Bauxite deposits are the largest bauxite reserves in the country, with Orissa accounting for 51 percent and AP 21 percent of the total reserves of India. The bauxite deposits of AP sector are broadly divided into Araku, Chintapalli and Gurtedu groups. Though bauxite mining started in Orissa long back (25 years), it is yet to start in AP. According to Oskarsson (2009), the causes of this obstacle in AP are control of technology by a few multinational companies, lack of financial resources, violent Maoist movement gaining strength in the bauxite hills, and the awakening of the civil society to the negative consequences of bauxite mining. However, the present Congress Government again promoted this project.

The Government of Andhra Pradesh signed two MoUs, one with Jindal South West Holding Limited (JSWHL) of the Jindal Group and the other with the Government of Ras Al Khaimah (GoRAK) to set up an Alumina and Aluminum Refinery and Smelter in the state of AP, at locations other than the Scheduled Areas. The proposed refinery of Jindal is in the plain area of S. Kota Mandal of Vizianagaram District and the proposed alumina complex of GoRAK is in the plain area of Makavarapalem Mandal of Visakhapatnam District. Both the cases are identical in their plan to mine bauxite from the Agency Area of Visakhapatnam District via government-owned Andhra Pradesh Mineral Development Corporation (APMDC).

In the mean-time, lots of agitation was going on in these coastal districts of AP to stop mining. Samata and AP *Girijan Sangham* demanded the project to be stalled; they organized awareness programmes to create awareness about the harmful effects of bauxite mining, and protest rallies and *dharnas* to stall the project. Both the companies have submitted their Environmental Impact Assessment (EIA) Report to the Ministry of Environment and Forest with the help of a consultant agency. A detailed analysis of the EIA report shows that, they have neglected the socio-economic part. Neither is there any clear analysis about the existing socio-economic conditions of the people, nor on

the future impact of mining on their livelihoods. Therefore, the Research Unit for Livelihoods and Natural Resources (RULNR) of the Centre for Economic and Social Studies (CESS), Hyderabad, tried to fill this gap. To conduct this study, Samata, a social justice organization in Visakhapatnam, was identified as partner. Samata works for the rights of the tribal people of AP and for the protection of the natural resources and ecology of the Eastern Ghats.

The study has the following main objectives:

- (i) To map the existing livelihoods pattern of the affected communities in the mining and refinery areas.
- (ii) To assess how mining will influence the livelihoods of the communities and what exactly will be the benefits and costs from the mining projects.
- (iii) To understand the Resettlement and Rehabilitation (R and R) packages and to study the communities' perception of the same.

Both primary and secondary sources of information were collected for the study. The study areas are situated in the Visakhapatnam and Vizianagaram districts of AP. First, the study area is divided into four zones, consisting of four mandals. They are: S. Kota Mandal of Vizianagaram District (proposed Jindal Refinery), Anantagiri and Araku Valley Mandals of Visakhapatnam District (proposed Jindal Mining), Makavarapalem Mandal of Visakhapatnam District (proposed Anrak Alumina Complex) and G. K. Veedhi Mandal of Visakhapatnam District (proposed Anrak Mining). These zones are the strata of the study. A list of 15 villages, within three kilometers from the proposed mines and refinery areas, and where land acquisition has either finished or started, was prepared from these zones. However, the presence of Naxals prevented data collection in Anrak Mining area. Therefore, the final study is based on 12 villages from the first three mandals. Finally, 138 households from Jindal Refinery area, 51 households from Jindal Mining area and 166 households from Anrak Refinery area were selected. Analysis was done with the help of Sustainable Rural Livelihoods Framework.

5.2 The Findings

5.2.1 *Existing Livelihoods of Affected Communities*

According to the Sustainable Rural Livelihoods framework, people require a range of assets to achieve positive livelihood outcomes. They are: Human Capital, Natural Capital, Financial Capital, Physical Capital and Social Capital. These capitals are in the form of different livelihood assets that the households can use to make a living. Being rich in one

form of capital while having inadequate access to others will be unlikely to lead to sustainable livelihood outcomes.

In the study villages, there is a marked difference between the refinery villages and the mining villages. The mining area is full of tribal villages in the hilly forest, while both the refinery areas share the same characteristics in terms of all the capitals. Villages in Jindal Refinery areas are tribal dominated, though not a part of Scheduled Areas. Anrak Refinery area is dominated by Backward Castes. In all the three study areas, the households have a diversified source of income. Their major occupations are agriculture, farm and non-farm labour, job, NTFP collection, petty business, livestock rearing and other occupations such as driving, washing, taddy tapping, cooking etc. In all the villages, women have an equal share of participation in all the economic activities except jobs. This is because of the high illiteracy rate prevailing among women. Health problem is very high in the Jindal Mining area and Anrak Refinery area. Therefore, these households are not very rich in human capital.

Coming to social capital, these villages are members of different institutions such as PDS, DWCRA and Old-age Pensions, and they trust people in matter of lending and borrowing. There is a strong social bonding among the villagers. They are also rich in natural capital; most of the villagers have agricultural land, though the percentage of marginal farmers is more in the refinery areas. Jindal Mining area is also rich with NTFP. They have safe sources of drinking water, available in plenty. However, the households are not very rich in physical capital. All of them (except a few) have a house and other assets such as TV, fan, cycle and watch. The percentage of motorcycles and refrigerator is very less. Many also have agricultural assets, especially every household in Jindal Mining area.

The households are not very rich in financial capital. Nearly 70 percent of their monthly expenditure is on food, yet they do not have food security for a year. Only in Jindal Mining area, most of the households have food security. Most of them do not have ownership of livestock and as their income is not sufficient, they have to borrow. Sources of borrowing are SHGs and banks and primarily private lenders in Jindal Mining area, though percentage of borrowing is not much here. They borrow for agricultural use, social functions such as marriage, and to meet other household expenditures.

5.2.2 Displacement Scenario

Land acquisition has begun in both the refinery areas; it has not yet started in the mining area. In Jindal Refinery area, the process is completed. Many households have

lost their agricultural land. Acquisitions of houses, homestead lands, cattle sheds, open wells and trees are very less here. Majority of the households are properly compensated. For each acre of land they received Rs. 2, 00,500 as compensation money. Each *patta* holder has been promised a job by the company once it starts operation. All of them are trained in an institute of technology in Orissa for six months, and now they are receiving a monthly stipend of Rs.2200. As the villagers are not educated enough, most of the job are those of electricians and mechanics. Those household, who have not preferred job, received a cash compensation of Rs. 3, 00,000. Jindal has also promised share in the company.

In Anrak Refinery area, land acquisition process has completed. However, they are yet to receive full compensation. All of them have received cash compensation of Rs. 4,05,000 per acre for their agricultural land. Unlike in Jindal Refinery area, the percentage of households losing their homestead lands, houses, cattle sheds, trees and open wells is very high here. The villagers have received compensation money for cattle-sheds, trees and open wells. They are also asking Anrak to provide a resettlement colony, to which the company has agreed. Anrak has also promised to give a job, a ration card and two milch animals to each family. However, this process has not yet started and the people are looking forward to that compensation.

All the households have spent their compensation money in unproductive expenditure. The major heads are debt clearance, house construction, social function and household expenditure. Though saving money in banks has also a major percentage, it might not last for more than a year or two. Hence, the question is how will they sustain their livelihoods? The percentage of people who got jobs in the company is very less. What about the landless? Where will the women workers go for work as they do not have agricultural land now? Like all other compensation policies of India, this is also gender biased.

5.3 Policy Options

Worldwide research on development induced forced displacement and resettlement is increasingly focusing on revealing the impoverishment risks to which displaced populations are exposed and on the need for targeted counter risk and reconstruction strategies (Cernea 1997; Downing 2002). Compensation is still the main financial instrument used for restoring the livelihoods of affected communities. However, it is seen to be financially insufficient, and poorly conceived and implemented (Cernea 2007). For extractive industries like mining, Cernea (2007) has proposed: (a) using the windfall economic rent generated by the exploitation of natural resources; as well as (b) using a

fraction of those projects' normal benefits and channeling them to reconstructing resettlers livelihoods at higher than pre-displacement levels.

Van Wicklin (1999) has opened the avenue of "benefit-sharing" and argues that this approach is legitimate on economic, financial, moral and political grounds. A share of project benefits can start flowing into the resettlement areas during the reconstruction period and continue thereafter. Cernea (2007) argues that financing of improved resettlement is not only a financial matter. It also depends on political will and political decision making by the project owners. He has given the following examples of good national practices for benefit-sharing:

Colombia allocates a certain percentage of benefits from hydroelectric plants to the development of rehabilitated area. In Brazil, there is a principle of reinvesting a percentage of royalties from hydropower to the resettlement area. Canada adopted a strategy of partnering with the local communities for equity sharing. In China, there are important agencies, which have the responsibility of managing the reservoir development funds and initiating development interventions to benefit the resettlers. The Canadian Government made an agreement with the local indigenous communities as direct investors in hydro projects, by contributing their lands. This enables them to receive a share of project benefits as long-term partners, proportion to their land share in the construction of the project. Norway adopted the Power Taxation Act to ensure new and higher tax payments from power companies, which could then be redistributed.

Japan started a land-leasing experiment and twin financial transfers were made: (i) one payment to the landowners leasing the land, which will enable those farmers to develop alternative livelihoods for themselves, and invest the money received into nonland-based income generating activities. (ii) regular rent payments for the leased land, to be continuously paid to the local small-holders for the life of the project. Another innovative strategy which Japan has pursued is to convert dry land into paddy fields, introducing irrigation at government's cost. Each resettler received an area approximately twice as large as what was previously owned.

Sharma and Singh (2009) stated the R and R policy of Madhya Pradesh (MP) as a progressive package. Not only the government, but the newly-emerging super thermal power projects by the private sector in MP have also drawn up reasonably good R and R packages. The Mahan Super Thermal Power Project being set up by Essar Global has offered current market rates for the acquired lands, spacious plots for every adult in each affected family, and "unemployment allowance" to all the displaced persons. This allowance of Rs. 4,000 a month is to be paid till the project succeeds in offering a regular

job to the displaced persons or until he/she attains the age of 58 years, whichever is earlier.

Reddy (2006) praised the resettlement policies of Nizamsagar Project and Tungabhadra Dam Project in Andhra Pradesh. In the former, all displaced people were shifted to neatly built resettlement colonies and were given land for land compensation. They were also given cash grants to purchase agricultural implements. In the latter, all farmers, including tenants were provided land in the command area. Every family was given a constructed house. However, over the years the rehabilitation policy of AP was diluted – Nagarjuna-sagar Project and Srisailem project are such examples. Mishra (2005) study on the Rengali Dam in Orissa shows that due to its homogeneous nature, the rehabilitation policy treats all displaced households equally. It included the landless and also the assetless, who generally derived their livelihood by their labour, as eligible for allotment of land. Due to this policy, the size of landholding of the people increased after displacement.

Therefore, there is a need for creative approaches for identifying and using existing potential to effectively and productively resettle both farmers and the landless. To make this true a strong political will have to be exercised. Those who are forcibly displaced to make way for development projects should be regarded as the first entitled to access the benefits, and they should not be left undeveloped.

5.4 Conclusion

This study shows that all project-affected people do not have a sustainable livelihood. Though they are rich in some capital, they are lagging behind in other forms of capital. However, they are trying best to make a living out of their agricultural land, forest and labour. Once mining or a refinery starts, they will be deprived from all these assets. The compensation money paid is not enough for a sustainable living, and as the analysis shows none of them spent the money on alternate livelihoods. Jindal has tried to give a job to the *patta* holder and a share in the company. However, only time will tell how this will work. Again, this compensation policy is not covering the landless and the women. Therefore, Jindal should have tried for some initiative, with the help of the State Government to help the people trying for alternate livelihoods.

The compensation process for Anrak has not yet finished. However, their compensation package shows that, they are also giving importance to cash compensation. Like in Jindal area, here also compensation money is going to unproductive expenditure. However, unlike Jindal, Anrak has not promised any share in the company and is yet to train the people, to whom they have promised job. The Government of AP does not seem to be

too keen on this aspect. Mining and Refinery will also have a negative impact on environment and health. Hence, the companies should try and use improved technology, which results in less pollution.

Roger Moody, the Editor of *Mines and Communities*, asked, “Is there a real demand for alumina in India to necessitate bauxite mining in the Visakha Agency Area?” According to him, 600 tons of aluminum in India can be recycled. India should follow the example of Germany, which made recycling of aluminum compulsory. Mining will only benefit the companies, while the poor people will suffer all the related socio-economic and environmental outcomes. All the political parties in opposition are taking bauxite mining in Visakhapatnam as an important issue. But what is the sincerity of the opposition parties? The same parties forget the issue once they win the elections and might even go ahead with mining. The tribal and civil society organizations are trying their best to resist the mining, but only time will decide the fate of the tribals in Agency Area of Visakhapatnam.

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