

**IMPACT ASSESSMENT OF RESETTLEMENT
IMPLEMENTATION UNDER NATHPA-JHAKRI
HYDRO ELECTRIC POWER PROJECT**

BY

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ABBREVIATIONS

AERC	:Agro-Economic Research Centre, Shimla
E&RR	:Environment and Resettlement and Rehabilitation Department
GOHP	:Government of Himachal Pradesh
Ha	: Hectare (one ha=2.47 Acres or 12.50 bighas)
LV/HCV/MCV	: Light Vehicle, Heavy and Medium Commercial Vehicle
MHU	: Mobile Health Unit
NJPC	: Nathpa – Jhakri Power Corporation
OBC	: Other Backward Castes
PAFs	: Project Affected Families
PAPs	: Project Affected Persons
Re. AP	: Remedial Action Plan
R & R	: Resettlement and Rehabilitation
RAP	: Resettlement Action Plan
SC/ST	: Schedule Caste and Schedule Tribe
SDM	: Sub-Divisional Magistrate

EXECUTIVE SUMMARY

The 1500 MW hydroelectric power project of Nathpa-Jhakri Power Corporation (NJPC) is under implementation on the river Satluj in Shimla and Kinnaur districts of Himachal Pradesh with the financial assistance from the World Bank. The project has a 27.4 km. long headrace tunnel. The tailrace tunnel takes the discharge of the water after power generation back into the river Satluj. The powerhouse complex of the project is situated under ground. The NJPC has acquired about 395 hectares of land to create its facilities and infrastructure and to resettle displaced families. Of this about 171 hectares was government forestland and 224 hectares was private land acquired from 480 families from 22 villages in the project area near Rampur. The project affected families include 62 families rendered landless, (that is those who were left with less than 5 bighas(0.3760 ha) of land after acquisition), 59 families rendered homeless, and 87 shopkeepers from Jhakri village whose shops were acquired.

The present study has been commissioned by NJPC to independently assess the results of the Resettlement Action Plan (RAP) implementation and to assess the impacts in terms of changes in the living standards of the project affected persons in terms of income, occupation, consumption pattern, housing standards, assets and land ownership, and by improving basic amenities in the affected villages, etc.

Findings of the Study

The magnitudes of indices during 2002 (after the programme implementation) are compared with the base line data (1996 situation) and with the control sample household data (households in the project area which are not affected by the NJPC project). The data reveal that the family size of the PAFs has declined from 7.14 to 5.44 persons per family. The sex ratio has declined considerably (from 893 to 850 females per 1000 males). The proportion of minor individuals in the family accounted for 36 percent in 1996, which is now 27 per cent. The proportion of old persons declined from 6 per cent to 3 per cent. Literacy rate has increased from 58 per cent to 73 percent. The average annual household income (at 1996 prices) during the base line period was Rs.21,648 while in 2002 it is Rs.76,575. At current (2002) prices the base line income comes to Rs.29,114 and 2002 income is Rs. 1,04,640. In 2002 income of control households is Rs.67,596. Hence, it is quite clear that after rehabilitation the income of PAFs has improved when we compare it with base line income or control household income. Proportion of families living below poverty line has decreased from 25.6 per cent to 16.8 per cent now. The average per capita monthly expenditure of PAFs has increased from Rs.575 to Rs.674, showing an improvement in their consumption pattern and standard of living. The percent of workers engaged in regular employment has increased from 20 per cent to 30 per cent, while in agriculture it has declined from 72 per cent to 61 per cent. There has been a slight increase in the proportion of workers engaged in business activities (i.e. from 7 per cent to it has risen to 9 per cent). A significant change has been noticed in the housing situation. Now more people live in pucca (permanent) houses (45% as compared to 11% earlier), more families have now separate bathrooms (46% as compared to 21% earlier), and have separate toilets within house (39% as against 16% earlier). However, the average size of land holding of the families has declined from 1.21 ha to 0.373 ha. As compared to 1996 data the overall yield rate of maize has not changed but that of wheat has

increased. Number of all types of livestock owned by the PAFs has declined; the major decline was in sheep population. Before 1996 on average a family owned 7.7 sheep, the number of which declined to 0.7 only in 2002 which was due to the effects of NJPC project. Since holding sizes declined, the requirement of draught animals (bullocks) also declined on the farms. Earlier on average a family kept 1.5 bullocks, which in 2002 declined to 0.5 bullock per family.

Conclusions

The data collected from the sample PAFs clearly shows that the overall living standard of the families has improved due to NJPC project implementation. Following changes are noteworthy. There is significant increase in the proportion of workers in the regular employment, specially with NJPC and with its contractors as daily wage earners. The earning capacity of those who were below poverty line has been increased and thus some of them have crossed over to above poverty line families. Diversification of income and employment avenues through income generation schemes, towards business and other self employment activities, is taking place. There is improvement in the housing standard. The quality of health care has also improved due to enhancement of diagnostic facilities with the introduction of mobile health unit by MHU, which tours villages in the project area. The NJPC has taken measures to strengthen the existing infrastructure facilities, including health facilities and education and roads which are providing immense benefits to the PAFs in the project area.

Project affected families have received full and adequate compensation. The compensation amount has been used rationally and judiciously by the families. Overall situation of all the project affected people is better now.

CHAPTER - 1

INTRODUCTION

Background

1.1 The 1500 MW hydroelectric power project of Nathpa Jhakri Power Corporation (NJPC) is under implementation on the river Satluj in Shimla and Kinnaur districts of Himachal Pradesh with the financial assistance from the World Bank. Since it is a run of the river project, it has minimum sub-mergence and very little displacement of local population. A total of 480 families from 22 villages are affected by the land acquisition activities for NJPC. These villages lie on either side of NH-22 in a total distance of about 60 Km in the Satluj river valley near Rampur. The altitudes of effected villages vary from about 900 to 1800 m above sea level. All the affected villages, except for Nathpa, are on the left bank (south) of the river Satluj. The project has a 27.4 km. long headrace tunnel. The tailrace tunnel takes the discharge of the water after power generation back into the river Satluj. The powerhouse complex of the project is situated under ground. The NJPC has acquired about 395 hectares of land to create its facilities and infrastructure and to resettle displaced families. Of this about 171 hectares was government forestland and 224 hectares was private land acquired from 480 families from 22 villages in the project area. These project affected families include 62 families rendered landless, (that is those who were left with less than 5 bighas (0.3760 ha) of land after acquisition), 59 families rendered homeless, and 87 shopkeepers from Jhakri village whose shops were acquired.

1.2 In the project-affected areas the NJPC has implemented two plans for compensating the project-affected families. One is Rehabilitation and Resettlement Plan (R&R Plan) whose provisions are to provide land to those who became landless after their land acquisition, construct house/cash for house acquired, provide employment to one family member of landless PAFs, allot shop in shopping complex, assistance for physical mobilization for displaced families etc. The other plan is Remedial Action Plan (ReAP) whose provisions are: introduction of mobile health van, development of basic amenities in affected villages, income generation scheme for PAFs etc.

Resettlement and Rehabilitation Policy for the Project

1.3 The NJPC has followed the resettlement and rehabilitation policy formulated in consultation with the Government of Himachal Pradesh to provide assistance and rehabilitation measures to all those who are affected by the project. Its provisions include:-

- (a) Developed agricultural land to landless PAFs equivalent to the area acquired or 5 bighas whichever is less. This 5 bighas would include any land left with the family after acquisition. Allotment of land will be made on the basis of landless certificate issued by the SDM, of Rampur.
- (b) Alternative house with a plinth area of 45 square meter or a payment of Rs 45,000/- according to their choice, to each PAFs whose house were acquired.
- (c) Allotment of plots for shops at the Jhakri market for displaced shopkeepers.
- (d) Preferences in allotment of shops at the shopping complex build at Jhakri to displaced shopkeepers and other PAFs.
- (e) Provision of suitable employment to one member of each landless PAFs according to his capacity and qualifications, subject to availability of vacancy. However, a PAF who has been allotted a shop plot will not be eligible for employment.

Environment, Resettlement and Rehabilitation Policy of NJPC

1.4 NJPC had adopted the following environment resettlement and rehabilitation policy in April 1997:-

“We believe in sustainable development which is within the carrying capacity of supporting ecosystems and which caters to human needs and improves the quality of life. We are, therefore, committed to:

- (a) Respect and care for the community of life.
- (b) Bring about changes in personal attitudes and practices to enable the affected community to care for their own environment.
- (c) Address legitimate concerns of project affected persons.
- (d) Conserve the Earth’s vitality and diversity.
- (e) Minimize the depletion of non-renewable resources.

We will take utmost care to ensure that our activities do not threaten survival and quality of life of project affected persons by protecting, to the extent possible, their

habitats, natural systems and resources, and minimize depletion of non-renewable resources. Our special emphasis will be to achieve our objectives through community participation and by treating PAPs fairly and in keeping with the laws of the land. We shall endeavor to encourage education, family welfare, role of women-in-development, energy conservation, and basic necessities”

1.5 Development projects can have significant socio-economic impacts on the affected persons. In some cases the changes may be beneficial, in others may be detrimental. It is, therefore, important to identify, analyze and evaluate socio-economic impacts of projects on the individual, the households, and social groups within a community or on the entire community. It is in this context that ex-post evaluation and assessment of effects of RAP of NJPC to assumes importance.

Objectives and Scope of the Assessment Study

1.6 The main aim of this study is to independently assess the results of the Resettlement Action Plan(RAP) implementation and to assess the impacts in terms of changes in the living standards of the project affected persons. The RAP of NJPC was expected to improve the living standards of the project affected families in terms of income, occupation, consumption pattern, housing standards, assets and land ownership, and by improving basic amenities in the affected villages, etc. Hence, the present study has been commissioned by the NJPC to assess the impacts of its activities in the project affected villages. The study analyses impacts of NJPC in the project area with respect to the following ten socio-economic aspects:-

- (a) Impact on occupational pattern of project affected families (PAFs).
- (b) Impact on income and employment pattern of PAFs.
- (c) Impact on residential facilities of PAFs.
- (d) Impact on commercial assets of PAFs.
- (e) Impact on livestock assets of PAFs.
- (f) Impact on land use and cropping pattern of PAFs.
- (g) Impact on yield rates of crops grown by PAFs.
- (h) Impact on consumption pattern of PAFs.
- (i) Impact on investment pattern of PAFs.
- (j) Impacts of physical infrastructure facilities created by NJPC in the project area.

1.7 The scope of the study includes, but is not limited to:

- Cover all types of impacts on different categories of project affected families.
- Review the overall implementation of the Resettlement Action Plan to include whether the desired objectives have been realized.
- Assess the changes in the living standards of different categories of project affected families based on sample survey in terms of income, occupation, material assets, land ownership and demographic characteristics.
- Explore the changes of enhanced benefits as perceived by PAFs and difficulties and adverse impacts encountered.
- Assess the working of mobile health unit in terms of its usefulness to the target population and how it contributed in reducing the morbidity rates and improving the health conditions in the affected villages.
- Find out how the compensation amounts have been utilized by the PAFs.
- Review the role of Environment and Resettlement Cell and the R&R Committee in implementing the resettlement programme.
- Assess how the income generating programs have contributed in supplementing the household income of the beneficiaries.
- Assess how the project has contributed to the improvement in basic amenities in the affected villages and the other community development initiatives supported by the NJPC.

Methodology

1.8 There are about 480 families, which have been affected by the project implementation. These families comprise of following six categories: (a) Those who have lost whole or part of their land and were offered land for land to bring their holding up to 5 bighas if it became less than their after acquisition and cash compensation for the rest of land acquired, (b) Those who have lost their houses and have been offered alternative houses or cash in lieu of houses, (c) Those who have lost their shops and have been allotted alternative shops or shop plots, (d) Those landless PAFs who have been offered employment in the project, (e) Those who have been paid

only cash compensation and are not eligible for other benefits, and (f) Those PAFs who were covered under the 'Income Generation Scheme' of the RAP.

1.9 This impact assessment study is mainly based on sample survey data of affected families across different categories. The individual survey interviews and focus group discussions were held in the affected villages. The required secondary data have been obtained from the project record and progress reports. For comparison purposes required data from the base line survey for the year 1996 have been used. When such data are not available, the same have been collected on recall basis from sample households. The field survey was conducted in the month of August 2002. About 15 per cent sample of each type of PAFs has been selected for the survey so that the socio-economic impacts could be assessed for each of these categories of households. The data have been collected by personal interview method by using structured schedule / questionnaire. The reference period for the study is 2001-2002. The numbers of different categories of PAFs surveyed in the study are given in Table 1.1 below.

Table-1.1: Category wise number of sample households surveyed in the study.

S. Nr.	Category of household:	Sample Size
(a)	Those who have lost land and were offered land for land	10
(b)	Those who have been offered alternative houses / cash	16
(c)	Those who have been allotted alternative shop plots	14
(d)	Those who have been offered employment in the project	12
(e)	Those who have been paid only cash compensation	61
(f)	Households covered under income generation scheme	11
	Total	124
	Control sample households	25

CHAPTER- 2

OVERALL REVIEW OF IMPLEMENTATION OF RESETTLEMENT ACTION PLAN

Resettlement of Landless Families

2.1 Approximately 224 hectares of private land has been acquired from 480 families for the NJPC Project. The owners of the land acquired have been compensated for their land as per the rates fixed by the Government of Himachal Pradesh. Those families who were left with more than 5 bighas land after acquisition of part of their land were paid cash compensation only. However, those families, which were rendered landless their remaining land being (less than 5 bighas) have been provided alternative developed land by NJPC. Under the *antyodaya* programme of poverty alleviation, the Government of Himachal Pradesh implemented a scheme wherein those families who owned land less than 5 bighas (one acre) were provided additional land from out of the village common land so as not to live any rural family with less than 5 bighas land. The NJPC has allotted developed agricultural land, to each family who is rendered landless after land acquisition, equivalent of the area acquired or 5 bighas, whichever is less. The average area of land allotted per landless PAFs by NJPC comes to 2.2 bighas (0.175 ha.). Forty-one families from Jhakri and 21 from Kotla village were rendered landless. Out of 41 landless PAFs from Jhakri 37 families have been provided alternative developed land in Jhakri itself. In Kotla village initially 21 PAFs were identified as landless who were to be allotted land at Nogli village by the Government of Himachal Pradesh. The PAFs did not agree to take the land earmarked for allotment for them at Nogli because of its very poor quality soil and its distance from their original village. An expert team from Himachal Pradesh Agricultural University, Palampur on request from NJPC, conducted soil tests of this Nogli village land. The findings of the soil tests confirmed that the apprehensions of the PAFs of Kotla were correct. The NJPC requested the Government of Himachal Pradesh to explore the availability of alternative land for distribution to landless PAFs of Kotla village. However, now the latest situation is that as per the verification by SDM, Rampur out of 21 landless families of Kotla only 4 are eligible and all the 4 landless PAFs of Kotla have been provided alternative developed land in Kotla village itself.

Resettlement of Houseless Families

2.2 Each oustee family which has been rendered houseless on account of acquisition of house land for the project has been provided house with a built up plinth area of 45 square meter or alternatively has been paid cash grant of Rs 45,000/- to construct house with atleast 45 square meter plinth area. If the plinth area was less than 45 square meters the cash grant was reduced accordingly. Out of the 61 families who were rendered houseless by the project, 43 opted for cash compensation which has been paid to them. And 18 opted for house they were given alternative constructed house in Resettlement Colony at Jhakri (16 have already taken possession the houses). The physical mobilization of the oustee families to the new houses was done at the project cost. The water supply, electricity, street and approach paths in the rehabilitation colony have been provided at the project cost. Majority of the village houses in the project area were temporary kuccha (mud wall with tin/ slate roofs) structures. Those PAFs who were given cash compensation had now built permanent (pucca) and bigger houses. Similarly, the alternative houses provided by the NJPC in the Resettlement colony are of permanent nature. The PAFs feel that compensation grants in lieu of old house was sufficient to build a new permanent house. Some households have built bigger houses (more than 45 square meters) with compensation money plus some money from their own sources.

Resettlement of Shopkeepers

2.3 A total of 87 shopkeepers have been displaced by the project. Out of these 79 were eligible for shop plots in market complex developed by the NJPC at Jhakri. Till date 71 shopkeepers have been allotted developed plots and remaining 8 are yet to get plots as the land development is in progress. Out of 71 displaced shopkeepers who were provided alternative shop plots in the market complex, 34 have constructed their shops and 14 of them have already started their business from the new shops. The NJPC has provided water supply, sewerage system, streetlight and other amenities in the market complex. Since the shop plots provided are a little away from the main highway and old market the trading has not yet fully shifted to the Market complex. Therefore, some displaced shopkeepers who have been allotted shop plots have also taken shops on rent in the old market and continue to operate from the remaining old market at Jhakri. Nevertheless, they have also taken possession of plots / shops in the new market complex where they would shift when the new market will becomes fully operational.

All shops in the new market complex are of permanent structure unlike old shops which were mostly kuccha structures.

Employment to Members of Landless Families

2.4 In the rehabilitation and resettlement plan of the NJPC there is a provision the NJPC would provide employment to one member each of the landless PAFs. The identification of landless families who are affected by the project has been done by the Sub-Divisional Magistrate of Rampur. Out of 62 families who are rendered landless by the project, one person each from the 51 families has already been provided a regular employment in the NJPC according to his/ her capability and qualification. To provide widespread defused benefits to more families and to avoid multiple benefits accruing to a same family, the NJPC ensured that those PAFs who have been provided employment shall not be eligible for allotment of shops in the market complex constructed by the NJPC at Jhakri and vice-versa. Among 51 persons who were provided employment, in the NJPC 29 percent were women. Since the qualifications of the candidate were below 12th standard, without any vocational training therefore, the jobs provided to them are of unskilled nature mainly as attendants. However, some of them who acquired skills of computer word processing while in employment at the NJPC have been promoted as clerks. Because some landless PAFs failed to nominate eligible member for employment in the NJPC, the full target of providing employment to 62 persons from landless PAFs could not be achieved. Some PAFs who are having more than one un-employed persons in the family, could not resolve as to which member from the family should be nominated for employment. Project authorities also considered proposals for award of petty contracts to the co-operative societies formed by PAFs on preferential basis so that some of them could be engaged in such jobs.

Resettlement of Families who Got Cash Compensation only

2.5 The NJPC paid compensation to PAFs for the land acquired according to the compensation rates fixed by the Rural Development Department for various types of lands. Out of this cash compensation some of the PAFs have purchased vehicles (cars and trucks) for commercial purposes and thus acquired an asset, which yields regular flow of income and employment to the family. Some of the households have constructed permanent houses out of the land compensation money received by them and have rented-out the new house, earning regular monthly income for the family.

Some households have put their compensation money in the term deposit accounts in the banks and are earning interest on it. However, there are some households, who have used the cash compensation of their land acquired by NJPC on non-productive expenditures marriages of their sons and daughters, treatment of diseases, purchase of household goods, etc

Grants Provided Under Income Generation Scheme

2.6 The NJPC has started an income generation scheme to assist project affected persons. Under the income generation scheme of NJPC some unemployed members of PAFs are encouraged to take up non-land-based income generation activities, such as weaving, knitting, beekeeping, tailoring, grocery shop, small dairy, etc. for diversifying their household incomes. Under this scheme NJPC provides a financial grant of Rs 15000/- per family for a particular activity. Only 33 PAFs availed assistance from NJPC under this scheme. A sample of 8 such families was taken for this assessment study. Out of these 8 families 5 families has used their grants for some other unproductive purposes and only 3 families have used grants for the required purposes. Since the people of Himachal Pradesh have tradition of mostly working in paid jobs in government, semi-government and private sectors, they lack desired entrepreneurship and risk taking attitudes, which are required for taking up self-employed income generation activities. Therefore, the income generation scheme of NJPC did not achieve desired success. Firstly the response for availing the benefits of this scheme was poor (only 33 out of 480 PAFs availed the facility). Secondly, the rate of diversion of grant to other activities than the required ones was very high (63 %). Nevertheless, the scheme is good. The survey revealed that on an average person running daily needs shops under this scheme earns a net profit of Rs 60 per day from the initial investment of about Rs. 11,000. Those persons who started rearing cross-bred cows under this scheme, after meeting their cost are earning net income Rs 70 per day. The development of NJPC colony at Jhakri village has created a sizeable market for milk where farmers are selling milk at the rate of Rs 12 per litre as compared to Rs. 9 per litre earlier. It was suggested by the villagers that while providing financial assistance for self-employment income generation, the technical and marketing know-how should also have been provided to them. The lack of previous experience has resulted in failures and low profits in the new ventures started by PAFs with financial assistance from the Income Generation Scheme of the NJPC.

Mobile Health Unit and Hospital

2.7 The Mobile Health Unit (MHU) of the NJPC started functioning in January 2000. The unit has a team consisting of a male medical doctor, a pharmacist and a driver, who tour villages in the van which is fitted with medical equipments. Four visits per week are made by the team; two in project affected villages of Kinnaur district and two of the Shimla district. About 50 patients are examined daily in Shimla district and about 80 patients in Kinnaur district villages. More than twelve thousand patients have been examined and treated by the MHU so far. The common ailments are diagnosed in the van itself and the patients are provided medicines there itself. However, the chronic patients are referred to the hospital for further thorough examinations. In general the village people are not fully aware about their various health problems. But, as a result of visits by MHU, the awareness of the villagers about basic hygiene, balanced diet, and symptoms of common diseases is increasing. Villagers informed that they are happy with the services of and medicines provided by the MHU. But they suggested that the MHU time period of about 15 minutes per village is not sufficient which should be increased to at least 30 minutes per village. Rural women told that MHU team should also have a lady doctor with them, because most of the health problems of rural areas are related to women and children who are least mobile. Nevertheless, the people in the project area have now become more health conscious and they more often seek advice, because of availability of diagnostic facilities of MHU at their doorsteps. The common ailments found by MHU among the males of the project are worm, hypertension, vitamin deficiency, and stray cases of T.B. Among females the problem of anaemia, leucorrhoea, and malnutrition are common. Rural children frequently suffer from cold, fever, and vitamin deficiency. The main problems faced by the MHU are: (i) frequent breakdown of its mobile van (it has been suggested that there should be a ready-made health van, instead of this locally fabricated van), and (ii) the quantity of vitamins, de-worming and iron tablets supplied to MHU by the hospital should be increased. At secondary level the establishment of the project hospital in NJPC Colony at Jhakri at the cost of Rs.13.22 million is also providing health facility to the local people. A 200 beds hospital constructed at Khaneri, Rampur by the State Government with the financial assistance of Rs.80 million from the NJPC is operational in the project area. Hence, there has been an overall improvement in the health care facilities in the NJPC project area for the betterment of the local people.

Transport and Communication Facilities

All the project affected villages were already having motor-able roads, and had electricity and piped water supply. All the villages were already having access to health centers and primary schools, which were located within 5 km distance. The bank, post office, veterinary dispensary and the local markets were within a radius of 8 km. from the villages. However, the villagers are appreciative of measures taken by the NJPC for improvement in road facilities, creation of pathways, and bailey bridges across nullahs, and rivulets at the cost of Rs.12 lacs, which have reduced travel time and distances of the villages with nearby towns and among villages of the area. Development of transport and communication facilities not only make travel easy, but they also increase the frequency of travel and provide easy and fast accessibility of villagers to the markets, and also encourage production of high value perishable farm products for market sale. The creation of infrastructure by NJPC in the nearby rural areas will help farmers in switching from the traditional subsistence farm production system to the high value cash crops in the project area, which would ultimately increase farm income and employments of the people in the vicinity of the NJPC project. Private taxis and trucks are hired by NJPC, which enhanced family earnings of PAFs engaged in transportation activities. A sizeable market for agricultural products such as vegetables, fruits, and milk has emerged in area since many out sides people have moved to NJPC project activities in that area.

Enhancing Educational Facilities

2.9 A reputed private school (Delhi Public School) has been established at Jhakri with a grant of Rs.20 million from NJPC for the children of NJPC staff. It is also providing quality educational facility to the local people. The PAFs have to pay subsidized fees for their children in this private school, which is otherwise very costly as compared to the fees paid in the government public school. So this provision of quality education at lower rates will prove rewarding to the children of PAFs. The NJPC has also helped in building additional class rooms and development of playgrounds in the government schools operating in the villages in the project area. A sum of Rs.70 lacs has already been spent on school buildings and playgrounds by the ER&R Department of the NJPC. The school at Sansara village has been provided playground with the financial assistance from NJPC. Financial assistance provided for construction of school building at Shah village is also appreciated by the people who

are very conscious about the better education for their children. Establishment of schools, playground and additional rooms to existing schools will go a long way in improving the quality of education and sportsmanship in the villages in the project area. People in the project area are happy about these developments in their villages, which they feel will immensely help in their overall socio-economic development.

Overall Changes in Standard of Living of PAFs

2.10 Changes in the key indicators of standard of living of the project affected families are shown in Table 2.1. The magnitudes of indices during 2002 (after the programme implementation) are compared with the base line data (1996 situation) and with the control sample household data (household in the project area that is not affected by the NJPC project). The data reveal that the family size of the PAFs has declined from 7.14 to 5.44 persons per family. The sex ratio has declined considerably (from 893 to 850 females per 1000 males). The proportion of minor individuals in the family accounted for 36 per cent in 1996, which is now 27 per cent. The proportion of old persons declined from 6 per cent to 3 per cent. Literacy rate has increased from 58 per cent to 73 per cent. The average annual household income (at 1996 prices) during the base line period was Rs.21,648 while in 2002 it is Rs.76,575. At current (2002) prices the base line income comes to Rs.29,114 and 2002 income is Rs. 1,04,640. In 2002 income of control households is Rs. 67,596. Hence, it is quite clear that after rehabilitation the income of PAFs has improved when we compare with base line income or control household income. Proportion of families living below poverty line has decreased from 25.6 per cent to 16.8 per cent now. The average per capita monthly expenditure of PAFs has increased from Rs.575 to 674, showing an improvement in their standard of living. The percent of workers engaged in regular employment has increased from 20 per cent to 30 per cent, while in agriculture it has declined from 72 per cent to 61 per cent. There has been a slight increase in the proportion of workers engaged in business activities (i.e. from 7 per cent to 9 per cent). However, on the whole there has been no significant change in the total employment days of the family members. A significant change has been noticed in the housing situation. Now more people live in pucca (permanent) houses (45% as compared to 11% earlier), more families have now separate bathrooms (46% as compared to 21% earlier), and have separate toilets within house (39%) as against 16% earlier). However, the average size of land holding of the families has declined from 1.21 ha to 0.373 ha. As compared to 1996 data the overall

yield rate of maize has not changed but that of wheat has increased. Number of all types of livestock owned by the PAFs has declined; the major decline was in sheep population. Before 1996 on average a family owned 7.7 sheep, the number of which declined to 0.7 only in 2002 which was due to the effects of NJPC project. Since holding sizes declined, the requirement of draught animals (bullocks) also declined on the farms. Earlier on average a family kept 1.5 bullocks, which in 2002 declined to 0.5 bullock per family. The data collected from the sample PAFs clearly shows that the overall living standard of the families has improved due to NJPC project implementation. Following changes are noteworthy. There is significant increase in the proportion of workers in the regular employment, specially with NJPC and with its contractors as daily wage earners. The earning capacity of those who were below poverty line has been increased and thus some of them have crossed over to above poverty line families. Diversification of income and employment avenues through income generation schemes, towards business and other self employment activities, is taking place. There is improvement in the housing standard. The quality of health care has also improved due to enhancement of diagnostic facilities with the introduction of mobile health unit which tours villages in the project area. The NJPC has taken measures to strengthen the existing infrastructure facilities, including health facilities and education and roads which are providing immense benefits to the PAFs in the project area.

Eco-Development in the Project Area

2.11 The satluj river water impounded by the NJPC dam at Nathpa is covering about 25 hectares areas only. Thus it has little ecological effect or displacement of people at the dame site. In fact there is a provision of Rs.160 lacs for development of fisheries in this reservoir, which will generate regular income for the local fishermen. Afforestation programme have also been supported by the NJPC. In place of the 171 hectares government land acquired by it, the NJPC is supporting a forestation programme on 342 hectares denuded land of the Forest Department with a cost of about Rs.3.2 million. The soil and water conservation programmes have also been undertaken in the catchments area of the project. In the group discussion villagers suggested that in the tree planting programmes in the project area top priority should be given to the plantation of multiple purpose tree species which could provide them fodder, fruit, fuel-wood, small timber, etc.

Role of ER&R in Plan Implementation

2.12 The organizational chart of the Environment Rehabilitation and Resettlement Department is shown in the flow chart given in the Appendix. The staff of ER&R Department has been able to achieve their objectives, but there have been some deficiencies in identification of beneficiaries of RAP and thus some of the aspects of social welfare have been lagging. The work of ER&R in particular and NJPC as a whole has been greatly hampered by the political interference in their programmes. Undue demands of villagers and vested interests of leaders divert the attention of the staff from their normal work. Due to agitations by PAFs its programmes get delayed. There is delay and operational problems due to the pressure groups and the involvement of politicians even in the minor affairs of rehabilitations. Tactics like the 'dharnas', road blockages etc. hampered the smooth operations of not only the ER&R operations but also the NJPC as a whole as well. Even then it may be concluded that the Rehabilitation Action Plan (RAP) of the Nathpa-Jhakri Power Corporation has successfully implemented with great success and its objectives of rehabilitation and resettlement of project affected families have been achieved. More detailed category wise impact analysis of the RAP implementation is discussed in the next chapter.

Table-2.1 : Key changes in the over all living standard of project affected families.

#	Indicator	Base line survey (1996) ^a	Impact Assessment study survey (2002) ^b	Control sample households survey (2002)
1	Average family size	7.14	5.44	5.80
2	Sex ratio (No of females per 1000 males)	893	850	920
3	% of minor individuals (Below 18 years)	35.83	26.65	38.28
4	% of old persons (above 60 years)	6.34	2.57	3.45
5	% of Illiterates	41.70	27.39	31.55
6	Average annual family income (at current prices)	29,114	1,04,640	67,596
	Average annual family income (at 1996prices)	21,648	76,575	49,622
7	% of families living below poverty line	25.6*	16.80**	20.0**
8	Monthly per capita expenditure (Rs)	575 R	674	423
9	% of workers employed in agriculture	71.8 R	61.3	69.2
10	% of workers in wage labour /service	19.9 R	29.6	27.2
11	% of workers in business	7.4 R	9.1	3.6
12	Annual work per household (days)	412 R	415	483
13	% of households living in pucca houses	11	45	18
14	% of households having separate kitchens	68 R	87	63
15	% of households having separate bathrooms	21 R	45	13
16	% of households having separate toilets	16 R	39	9
17	Average land holding size (ha.)	1.21	0.373	0.661
18	Average land under cultivation (ha.)	1.10	0.283	0.304
19	Average yield of Maize crop (Kg./ ha.)	1532 R	1552	1542
20	Average yield of wheat crop (Kg./ ha.)	1109 R	1218	1055
21	Average # of livestock per household	11.15	2.43	16.46
22	-Cows	1.91	1.25	1.70
23	-Bullocks	1.55	0.45	0.86
24	-Sheep/goats	7.69	0.73	13.90

Note:* Those households whose annual income was below Rs 11,000 in 1995-96.

** Those households whose annual income was below Rs 17,340 in 2001- 02.

R= Data from Recall memory referring for the year 1995-96, which was collected from sample survey of project affected families during this Impact Assessment Survey, 2002.

Source: (a) Base line survey data are taken from the Remedial Action Plan for Project Affected Persons, Nathpa-Jhakri Power Corporation, Shimla, September, 1999.

(b) Impact Assessment Survey, 2002.

CHAPTER –3

SOCIO-ECONOMIC IMPACTS OF THE NJPC PROJECT ON DIFFERENT CATEGORIES OF AFFECTED FAMILIES

Introduction

3.1 Development projects have both direct and indirect effects on the people living in the project area. Some of the effects may be beneficial to the people, while some of them may have adverse impacts on the socio-economic and environmental conditions of the people. The socio-economic impacts of NJPC activities assessed in this study are: (i) impact on occupation pattern of project affected families, (ii) impact on employment pattern of PAFs, (iii) impact on residential facilities of PAFs, (iv) impact on commercial assets of the families, (v) impact on livestock assets, (vi) impact on holding size and cropping pattern, (vii) impact on crop yields, (viii) impact on consumption pattern of project affected families, and (ix) impact on investment pattern of the households. Detailed data from households sample survey conducted by the Agro-Economic Research Centre of Himachal Pradesh University, Shimla with respect to aforesaid impacts on different categories of project affected families are presented in Appendix Tables. The impact wise broad results are highlighted in the following paragraphs.

Impact on Occupational Pattern of Project Affected Families

3.2 Impact of resettlement action plan of the NJPC on occupational pattern of different categories of PAFs has been analyzed separately and the results are presented in Appendix Tables 3.2.1 to 3.2.5. Among those households who got land for land the comparison of past (1996) and present (2002) occupational patterns reveal that about 58 percent workers were engaged in agriculture in 1996 while this proportion has declined to 48 per cent in 2002. The proportion of family workers who are in service (regular jobs) has increased slightly (from 32% to 35%) during 1996 to 2002. Earlier no one from the family was in business, but now about 8 per cent of the workers from this category of households are engaged in petty business (a new experience to them). In the case of those families who were given house for house or cash compensation, about 81 per cent of their workers were earlier engaged in agriculture; while at present about

62 per cent workers are in agriculture. The proportion of workers in service has increased from 10 per cent to 24 per cent and of those in business from 8 per cent to 13 per cent during 1996 to 2002. However, there are no changes in occupational patterns of those families who were allotted shop plots, and those who received cash compensation only. However, a major change was reported by those landless PAFs whose members were provided employment in the NJPC. Earlier (in 1996) the proportion of their workers in agriculture was 69 per cent which has now decreased to 40 per cent. The Proportion of workers in service (regular jobs) has increased from 31 per cent to 54 per cent. About 6 per cent workers from these families have started petty business activities also. On the whole it may be concluded that due to the project there has been a shift of workers from agriculture to non-agricultural activities (regular job and petty business activities). With new avenues of income earning in the project area the diversification in the occupational patterns is taking place.

Impact on Income and Employment Pattern of Affected Families

3.3 Impacts of the NJPC project on income and employment of different categories of PAFs are shown in appendix Tables 3.3.1 to 3.3.5. A comparison of past and present situations reveals that average annual employment of those households who were given land for land has increased from 393 days to 550 days per household. The average annual income has increased from Rs.45,222 to Rs.1,07,422. The share of agriculture in the household income has declined because of reduction in the size of their land holdings. But their income from wage labour and service has more than doubled as compared to their past income six years ago. The average income of those households who got compensation for house construction has increased from Rs.28,333 to Rs.50,933. In the group also there has been a drastic reduction both in employment and in income earned from agricultural activities, whereas the employment and income from regular jobs have increased. In the case of those households who were allotted alternative shop plots average annual income was Rs.79,867, in 1996, which increased to Rs.1,81,107 in 2002. This change has been mainly due to increase in petty business/trading activities, which have increased due to increased demand for daily need items from residents of new NJPC colony and also due to the increased purchasing power (income) of PAFs. Average income of those families who have been provided employment the NJPC has increased from Rs.68,874 to Rs.1,41,759 per annum. The increase in household income has been mainly due to increase in employment in non-

farm activities. Those households who were provided cash compensation only have also improved their economic position. Average annual employment of these families was 350 days in 1996, which has now increased to 401 days. Similarly the average annual household income has increased from Rs.77,677 to Rs.98,721 at present (in 2002).

Impact on Residential Facilities of Project Affected Families

3.4 Changes in residential facilities of different categories of project affected families are shown in Appendix Tables 3.4.1 to 3.4.5. The data reveal that with respect to residential facilities all categories of households are now better-off as compared to their situation in 1996. Now more families live in permanent pucca houses, more have separate kitchens, separate baths, latrines etc. in the houses. Earlier most houses were temporary (kucha) structures and were without these essential amenities. From sanitation and cleanliness point of view also, the situation is now better in private houses. The Resettlement colony of NJPC at Jhakri has two bed room houses with kitchen and separate bath and latrines attached to it. However, in the group discussion with those families who were provided house for house, it was pointed out that the single story constructed houses provided to them by NJPC in the resettlement colony at Jhakri are good for urban style of living, but if some family member wants to pursue agricultural activities it is not possible there. In hilly areas farmers generally have two story houses; while the ground floor of the house is used for housing animals during winter and rainy seasons and for storing grains and fodder, the first floor of the house is used for family living. Since villagers need dwellings both for family living as well as for their animals, the constructed houses provided by NJPC under house for house programme do not have provision for all the requirements of a rural family.

Impact on Commercial Assets of Project Affected Families

3.5 Commercial assets purchased and incomes accrued from them to different categories of families are shown in Appendix Tables 3.5.1 to 3.5.4. The emerging new avenues for earning income have been tapped by some of the interested enterprising households. Four families out of a sample of 10 of those families who were given land for land, have purchased taxis and now earn extra net income of Rs.60,000 per year. The demand for taxi service has increased in the NJPC project area for NJPC officials and for others. One persons out of sample of the families who were allotted shop for

shop, has purchased taxi, two persons have purchased lorries, and a taxi is earning annual net income of Rs.1,50,000 and a lorry Rs.1,90,000. Three persons from this category of households have opened teashop earning Rs.15000 annually and one person has opened general store, earning net income of Rs.16,000 per annum. Those families whose members have been provided employment in the project one person earlier owned a pickup vehicle valued at Rs.90,000, which has now been sold because that person has now got regular employment in the NJPC. Among those households who got only cash compensation, one person out of a sample of 61 families had taxi, which he still has two persons have established general stores and one person has purchased a photocopier machine. The person who had taxi earlier used to earn only Rs.9,900 annually, now, due to contract with NJPC, earns Rs.1,80,000 annually. From the general store average annual income is Rs.30,000. Thus there is a good trend that some PAFs who were earlier dependent on agricultural activities only have now created some commercial assets and are earning extra income by taxies, general stores, teashops, photocopier machines etc., and thus, have diversified their sources of incomes. These trends have been facilitated and enhanced by the NJPC activities in the project area.

Impact on Livestock Assets of Project Affected Families

3.6 Changes in livestock assets on different categories of project affected families have been examined and the results are presented in Appendix Tables 3.6.1 to 3.6.5. The data reveal that the numbers of all types of animals (i.e. cows, bullocks, sheep and goats) possessed by the project affected families have now decreased. Since the fodder resources in the project affected area have declined because of reduction in area of pastures and forestland, the farmers have been compelled to sell some of their livestock to reduce their number according to fodder resources as compared to their earlier situation of 1996. The NJCP has acquired 171 hectares of forestland, which was earlier available to farmers for grazing of their animals. Furthermore, the private land acquired by NJPC for non-agricultural use was earlier used mainly for agricultural purposes, from which crop residues and byproduct were available for animals, which are not available now. So these combined effects have created fodder scarcity in the project affected area and consequently the farmers have adjusted by reducing the number of their domestic animals. Farmers adjusted to the situation keep livestock as a source of supplementary income and as farm income stabilizer when there are high

fluctuations in crop incomes. Also livestock is a good source of manure needed for maintaining soil fertility and crop productivity. The livestock economy of the affected villages has been the main sufferer of the NJPC project activities.

Impact on Holding Size and Crop Area of Project Affected Families

3.7 Impact of NJPC project activities on holding size and cropping pattern has been analyzed and data for different categories of PAFs are presented in Appendix Tables 3.7.1 to 3.7.5. The sample survey data regarding those households who were provided land for land show that the acquisition of land from them has resulted in decrease in their average net area sown by 0.478 hectare. The average land holding size of those households who got alternative house was earlier 1.013 hectares, which has decreased to 0.190 ha. Their average net area sown has decreased from 0.928 to 0.109 ha. There has been decline in the area under individual crops; area of wheat crop decreased by 0.128 hectare, paddy area 0.115 hectare and area of maize crop by 0.102 hectare. Those households whose shops have been acquired by NJPC are basically traders who did not have much agricultural activities. Therefore, there is hardly any impact of resettlement on the land resources of this category of PAFs. Per household average land holding of those households who were provided employment in NJPC has declined from 0.71 ha to 0.422 ha after acquisition. Consequently the area of all crops grown by them has also declined. Reduction in paddy crops area was very substantial. The land holding size of those households who got cash compensation only decreased from 0.712 ha to 0.454 ha and consequently the average net area sown has declined by 0.254 ha. Hence, it is clear that land holding sizes of project affected families have decreased and the area of high productivity crops such as paddy and wheat has decreased in the project area.

Impact on crop Yields of Project Affected Families

3.8 The data on impact of NJPC project activities on the yields of various crops of different categories of project-affected families are given in Appendix Tables 3.8 .1 to 3.8.5. Those households who got land for land have stopped cultivating paddy crop, which requires good soil with irrigation. The productivity of other crops has increased in the range of 4 to 9 percent. As regards those families who got alternative houses or cash compensation are concerned, the productivity of their apple and paddy crops has declined by 53 percent and 12 per cent respectively. A mixed trend has been reported

in the changes in productivity of crops grown by those families whose members have been provided employment in the project. The productivity of wheat and maize crops of these families has increased by about 38 per cent and 71 per cent respectively, whereas the productivity of other crops has declined (i.e. in case of paddy by 20%, in pulses by 60% and in case of apple by 27%). The crop yields of those households who got cash compensation only have increased during 1996 to 2002 period. The productivity of plum orchards has increased by 11 per cent, of apple orchards by 8 per cent, of maize crop by 9 per cent and of wheat crop by 7 per cent. Hence, it may be concluded from the survey data that in some crops yields have increased, whereas in some crops the yield have decreased after the project. No clear-cut trend emerges from the comparison of past and present yield rates of different crops on various categories of households. The reduction in crop yields may be due to two reasons: (a) reduction in soil fertility, and (b) adverse weather conditions in the crops growing season. To maintain soil fertility the soils of hilly areas need a regular replenishment of organic humus material, which gets washed away due to soil erosion on sloping fields. Animal dung is a good source of organic manure for agriculture, but its quantity supplied has recently decreased because of reduction in livestock population in the NJPC project area. Since the yields of crops are significantly affected by weather conditions, by the year 2002 witnessed a below normal rainfall in general and thus the crop yields of many crops throughout the state have been affected adversely. Dust pollution by NJPC activities was already negligible because most of its activities were underground. Nevertheless an expert committee constituted by NJPC for studying the Impact of Blasting Dust on Fruit Production in NJPC Affected Areas reported that there were no signs of dust deposition on fruit trees and other vegetation in any of the sites surveyed. The low productivity in case of apple was not due to dust pollution but because of inadequate number of pollinizer plants in the orchards in the area. The productivity of stone fruits (plums, apricots, peaches) was also not affected in any manner. The committee concluded that the dust caused by blasting operations of NJPC was not the 'root' cause of the problem in the project area.

Impact on Consumption Pattern of Project Affected Families

3.9 Consumption patterns of project affected families have been analyzed and the results are presented in Appendix Tables 3.9.1 to 3.9.5. The consumption pattern of those households who got land for land reveals that their consumption of cereals has

increased by 9 per cent. The quantity of vegetables consumed by them has also doubled now. The quantity of fruit and meat consumed by the family has increased by 75 and 67 per cent respectively. Per capita consumption expenditure of those families who got house for house or cash compensation has increased only marginally from Rs.548 per month to Rs.581. Quantity of most of the items consumed by the family has increased slightly. The consumption pattern of those households who got shop plots indicates that they have increased consumption of pulses, vegetables, fruits, milk, meat etc. The past and present consumption patterns of those households whose members were provided employment in the NJPC project reveal that there has been an increase in the consumption of various food and non-food items. The quantity of cereals consumed by them has increased by about 7 per cent and consumption of milk, vegetable, fruits and meat has increased in the range of 20 to 35 per cent. Consumption pattern of those households who got cash compensations only also indicates that the quantity of food items consumed by them has increased, especially the quantities of pluses, milk and vegetables have registered significant increases in their diets. The higher expenditure on clothes and footwear also indicate that there are improvements in their standards of living. Now the expenditure incurred on education is also higher. On the whole it is quite clear from the survey data that the consumption patterns and standards of living of all the project affected families have improved as compared to their situation of 1996.

Impact on Investment Pattern of Project Affected Families

3.10 How was the compensation money received from the NJPC was utilized by the project affected families has been investigated. The results are presented in Appendix Tables 3.10.1 to 3.10.5. The PAFs who were given land for land received an average amount of Rs.4.28 lakh as compensation out of this about 66 per cent amount was used for purchase of agricultural land and 24 per cent was used for construction of new permanent houses. Some households have purchased light vehicles to run as taxis for generating of extra income for the family. Average amount of compensation received by those households who got alternative house or cash was Rs.2.61 lakh. About 53 per cent of amount has been used for house construction, 20 per cent for purchase of agricultural land, 14 per cent has been used for purchase of consumer durables, such as TV, furniture, etc., and 21 per cent of it has been put in the fixed deposits in the bank. The average amount of compensation received by those households who were allotted shop for shop was Rs.91,801 per shopkeeper. About half of this amount has been used

for purchase of land, and 26 per cent for construction of new house and 28 per cent for purchase of consumer durables and other purposes. The major amount of compensation (77%) of those households who got employment in the project has been deposited in the bank and about 15 per cent amount has been used for construction of house. Those PAFs who got cash compensation only for the land acquired from them have used about 34 per cent of the total compensation amount for purchase of agriculture land, 27 per cent for construction of new house or additional rooms in the existing house, and 14 per cent amount has been deposited in the fixed term accounts in the bank. Hence, it is clear from the analysis of utilization pattern of compensations amount that the compensations amount received by the PAFs have been used for productive purposes and for consumer durable items (such as TV, Washing Machine, Refrigerator, two wheelers etc.), which have enhanced income earning capacity and standard of living of the project affected families.

Chapter-4

CONCLUSIONS AND LESSONS LEARNED

Conclusions

4.1 The impact assessment study revealed that the following main changes have occurred in the project area due mainly to the resettlement implementation programme of the NJPC Project.

- (a) There have been positive impacts on income and employment pattern of project affected families. A slight shift in income and employment away from agriculture to non-farm activities has occurred in rural areas.
- (b) There has been increase in full-time employment in the villages due to NJPC activities. Under the employment programme of landless PAFs about 30 per cent jobs in NJPC are taken by women. Encouraged by NJPC, the contractors working with it also employ local laour as much as possible.
- (c) Proportion of families below poverty lone has declined and literacy rate has increased.
- (d) There is improvement in the residential facilities of the affected families as compared to their own earlier situation and as compared to the condition of non affected families in the project area. An over all improvement in housing standards is noticeable. (more pucca houses, separate kitchens, toilets within house).
- (e) Houses constructed under house for house programme of NJPC are permanent type and better constructed and have separate facilities for kitchens, baths, toilets etc. However, some families opined that the design of house should have taken into account various requirements of the rural family, which are different from the requirements of the urban dwellers.
- (f) Land allotted to landless PAFs under the land for land programme is of comparable quality.
- (g) The cash compensation amount received by the affected families has been judiciously and rationally invested on various types of productive assets, which have increased their income earning capacities. These assets are generating additional income and thus have diversified and stabilized income of the farming families.
- (h) There has been improvement in consumption pattern (towards more nutrition, protein, fruits & vegetables) of the project affected families.

- (i) Because the land was acquired for the project is more than the land area allotted, obviously, there has been a decline in the sizes of land holdings of the project-affected families. Consequently the gross cropped area has also declined in project-affected villages.
- (j) Since the area under crops, pastures and forests has declined in the project area, the fodder sources in the affected villages have dwindled. In response to this the farmers have reduced numbers of various types of livestock kept by them. The major impact has been on the population of sheep and goats, whose number has declined drastically after the NJPC project.
- (k) Compensation rates given to the PAFs were adequate. PAFs have received full compensation from NJPC. Many families were able to buy agricultural land elsewhere.
- (l) The shops or shop plots provided by NJPC under the shop for shop programme have more space, are of permanent structure, are in a market complex and have good roads, light, and toilet/ sewerage facilities. Although currently business is low at the new location, but as more shops will open, the business activities will pick up there, because of compact cluster of various shops in new market complex.
- (m) The mobile health unit of NJPC has provided easy access and extra diagnostic service facility to the people in the project area, helping in general improvement in the health status, increased awareness about the common diseases, and thus more curative and preventive actions by the local people on various family health related issues. The mobile health unit of NJPC has created a tremendous goodwill for NJPC among the people in the project area, because government doctors from the primary health centers rarely visit villages, and thus many ailments, especially among women and children, remained undiagnosed till the disease reaches chronic stage. Now the early diagnosis, and early and easy treatment of many diseases has become possible for the village people due to MHU.

Lessons learned

4.2 In the initial stages the public relation programme of NJPC has been poor leading misperception and agitation from PAFs. Later with a rigorous public relations programme and more involvement of project affected families and local leaders in the planning and implementation of ER&R programme, the NNPC could have reduce misperceptions of and resistance from the local people in the project affected area. The basic purpose of including public participation in rehabilitation planning process is to enable productive use of inputs and perceptions from governmental agencies, private citizens, and public interest groups in order to improve the quality of rehabilitation and

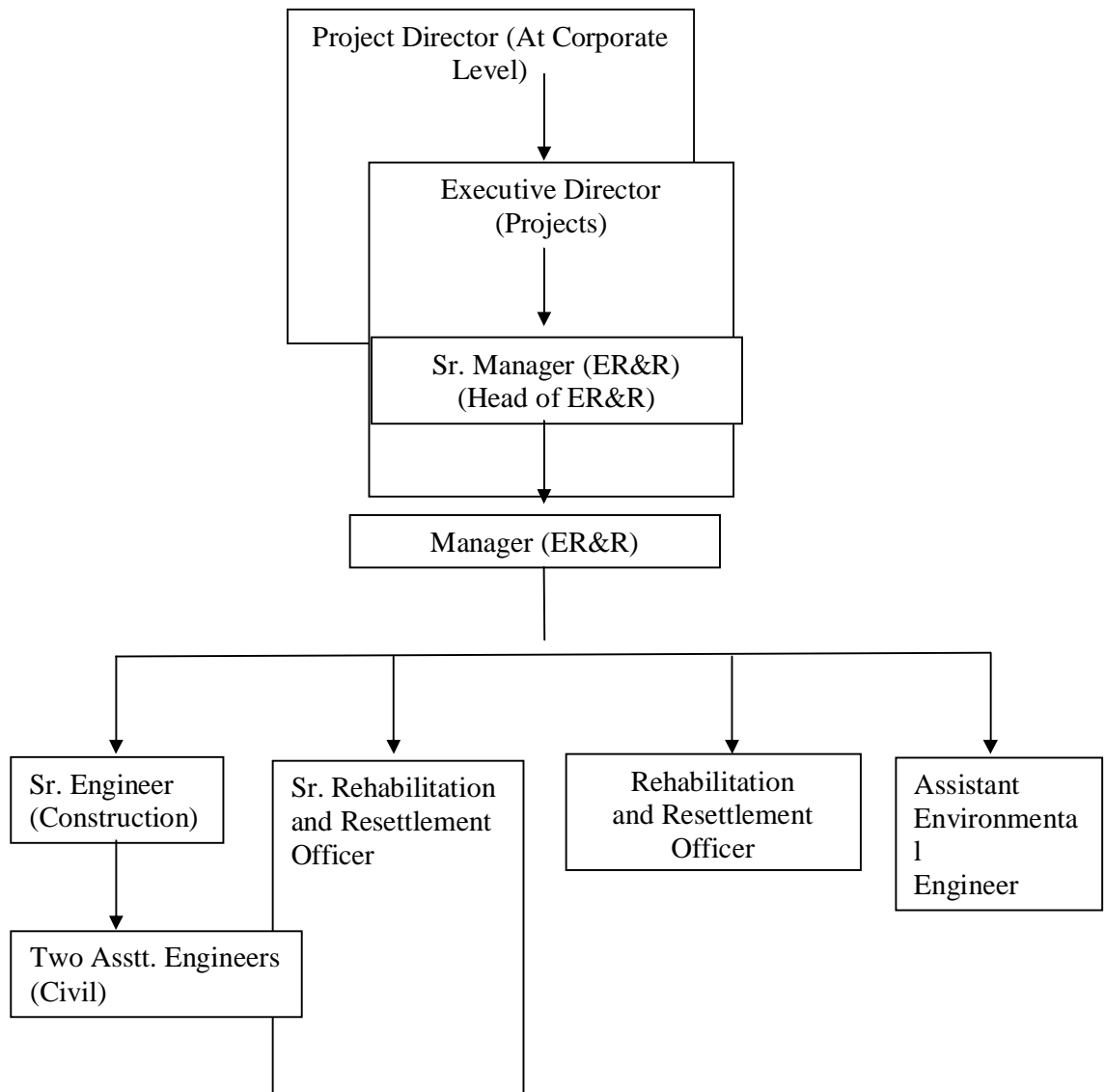
resettlement decision making. Public participation involving both information feed-forward and feed back promotes full public understanding of the programme.

- (i) To assess the environmental impacts of the project properly, it is necessary to conduct environmental status survey of the project area before the launching of the project. It helps avoid later complications. For instance, the people in the project area put blame on blating activities of the NJPC for depletion and drying up of water springs and streams, cracks in their houses etc. If the initial status report on total conditions in the project area would have been prepared, the NJPC could have saved a lot of compensation money by not entertaining those claims for damages which were not genuine. However, in the absence of bench mark survey and initial inventory, it could not refute the un-authentic claims.
- (ii) Baseline survey of PAFs was inadequate and did not visualize many ex-post impacts of the NJPC project. A detailed benchmark study giving information on various parameters, which would be impacted by the project, is very essential for ex-post facto evaluation of the resettlement and rehabilitation programmes of such projects.
- (iii) Rate of compensation should be adequate and fixed in advance by involving local people. Otherwise PAFs would time and again keep demanding more and more compensation at subsequent stages through their agitations and political pressures.
- (iv) The displacement of PAFs took place earlier than the resettlement plan and logistics were ready to help accommodate them. Hence, some families suffered hardships. The time gap between the displaceme4nt and resettlement should be minimum. The resettleme4nt site should be ready before the displacement takes place.
- (v) Where a programme involves allotment of land for land, the choice of new location and quality of land (and its suitability for various crops) should be examined ex-ante rather than doing ex-post facto examinations only when the affected persons complain about it. The NJPC would not have faced embarrassed situation by allotting unsuitable land to PAFs at Nogli village, if this precaution could have been taken at the planning stage itself.
- (vi) For better success of the income earning assets financed by NJPC under the income generation scheme, the programme should have been such, which are associated with the nature of their traditional occupations and which have linkages with the local demand and resources.
- (vii) Providing constructed houses should take into account not only the better amenities needed by the rural families, but also their livestock and agricultural needs.
- (viii) The benefit provided by the NJPC to the affected families have been disproportional to its degree of effect (amount of land acquired) from the affected families. The small and marginal land holders got multiple benefit

(land for land, built up house, employment and grant for income generating assets). The farmers complain that since RAP is a rehabilitation and compensation programme and not the poverty alleviation programme, the benefits to the PAFs from the NJPC should have been proportionate to the land acquired from them. Project benefits should be shared in accordance with the sacrifices made by various types of affected families. Otherwise it leads to resentments among PAFs.

- (ix) There have been some unintended harmful impacts of the NJPC project, which were not thought of and accounted for in the initial cost estimates of the project. The peak particles velocities during the underground excavation and blasting activities exceeded the maximum safe limits and thus caused damages to the buildings and other structures. On the request of NJPC a study conducted in the project area by the National Institute of Rock Mechanics, Kolar Gold Fields (Karnataka) indicated that the houses located within 60 meters of project construction sites have been within the zone of influence due to blasting at higher velocities than the maximum safe limit. This incautiousness on the part of NJPC has costed it Rs. 5.45 millions, which as a result has been paid as compensation amount for damages to the buildings and other structures of the farmers in the project area. Since no survey of buildings was done before the initiation of construction works, even those families whose houses were already had cracks due to faulty structural designs and setting of soil under the weight of house, they had also claimed compensation from the NJPC for the earlier damage of their houses.
- (x) The NJPC may further reduce the gender gap by involving women in development by providing vocational training in knitting, weaving, tailoring, secretary ship, accounting etc. for women in the project area and then providing assistance under income generation scheme.
- (xi) All terms and words used in policy documents and project plans should be well defined to avoid any ambiguity and misinterpretations at the operational stage. In the RAP of the NJPC, the term “land less” is very confusing.

ORGANISATION CHART OF R&R



Appendices

Table-3.2.1: Average number of family members in different occupations of those households who were given land for land.

(Number of Workers/Household)

Occupation	Past 1996	Present 2002	Change
1. Agriculture			
Male	(15.79) 0.33	(8.66) 0.22	-0.11
Female	(42.11) 0.88	(39.37) 1.00	+0.12
Total	(57.89) 1.21	(48.03) 1.22	-0.01
2. Wage labour			
Male	(10.53) 0.22	(8.66) 0.22	-
Female	-	-	-
Total	(10.53) 0.22	(8.66) 0.22	-
3. Service			
Male	(31.58) 0.66	(34.64) 0.88	+0.22
Female	-	-	-
Total	(31.58) 0.66	(34.64) 0.88	+0.22
4. Petty Business			
Male	-	(8.66) 0.22	+0.22
Female	-	-	-
Total	-	(8.66) 0.22	+0.22
Total			
Male	(57.89) 1.21	(60.63) 1.54	+0.33
Female	(42.11) 0.88	(39.37) 1.00	0.12
Total	(100) 2.09	(100) 2.54	+0.45

Note: Figures in brackets are percentages of total workers.

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.2.2: Average number of family members in different occupations of those households who got alternative house or cash compensation for house construction.

(Number of workers / Household)

Occupation	Past 1996	Present 2002	Change
1. Agriculture			
Male	(38.46) 1.0	(21.54) 0.53	-0.47
Female	(43.46) 1.13	(40.65) 1.00	-0.13
Total	(81.92) 2.13	(62.20) 1.53	-0.60
2. Service			
Male	(7.69) 0.20	(21.54) 0.53	+0.33
Female	(2.69) 0.07	2.85) 0.07	-
Total	(10.38) 0.27	(24.39) 0.60	+0.33
3. Petty Business			
Male	(7.69) 0.20	(13.41) 0.33	+0.13
Female	-	-	-
Total	(7.69) 0.20	(13.41) 0.33	+0.13
Total			
Male	(53.85) 1.40	(56.50) 1.39	-0.01
Female	(46.15) 1.20	(43.50) 1.07	-0.08
Total	(100) 2.60	(100) 2.46	-0.14

Note: Figures in brackets are percentages of total workers.

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Appendices

Table-3.2.3: Average number of family members in different occupations those households who were allotted alternative shop plots.
(No. of Workers /Household)

Occupation	Past 1996	Present 2002	Change
1. Agriculture			
Male	(12.27) 0.27	(8.81) 0.20	-0.07
Female	(42.27) 0.93	(44.05) 1.00	+0.07
Total	(54.54) 1.20	(52.86) 1.20	-
2. Wage labour	-	-	-
3. Service			
Male	(3.18) 0.07	(3.08) 0.07	-
Female	-	-	-
Total	(3.18) 0.07	(3.08) 0.07	-
4. Petty Business			
Male	(42.27) 0.93	(44.05) 1.00	+0.07
Female	-	-	-
Total	(42.27) 0.93	(44.05) 1.00	+0.07
Total			
Male	(57.73) 1.27	(55.95) 1.27	-
Female	(42.27) 0.93	(44.05) 1.00	+0.07
Total	(100) 2.20	(100) 2.27	+0.07

Note: Figures in brackets are percentages of total workers.

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.2.4: Average number of workers in different occupations on those households who were given employment in the project.
(Number/Household)

Occupation	Past 1996	Present 2002	Change
1. Agriculture			
Male	(28.05) 0.69	(3.14) 0.08	-0.61
Female	(40.65) 1.00	(36.47) 0.93	-0.07
Total	(68.70) 1.69	(39.61) 1.01	-0.68
2. Wage labour			
Male	-	(9.02) 0.23	+0.23
Female	-	-	-
Total	-	(9.02) 0.23	+0.23
3. Service			
Male	(31.30) 0.77	(45.10) 1.15	+0.38
Female	-	(0.39) 0.01	+0.01
Total	(31.30) 0.77	(45.49) 1.16	+0.39
4. Petty Business			
Male	-	(5.88) 0.15	+0.15
Female	-	-	-
Total	-	(5.88) 0.15	+0.15
Total			
Male	(59.35) 1.46	(63.14) 1.61	+0.15
Female	(40.65) 1.00	(36.86) 0.94	-0.06
Total	(100) 2.46	(100) 2.55	+0.09

Note: The figures in brackets are percentages of the total workers.

Source: Sample survey of PAFs in Impact Assessment Study, 2002

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Table3.2.5: Average number of family members in different occupations of those households who got cash compensation only.

(No. of workers/Household)

Occupation	Past 1996	Present 2002	Change
1. Agriculture			
Male	(38.35) 1.07	(34.15) 0.98	-0.09
Female	(37.63) 1.05	(39.02) 1.12	+0.07
Total	(75.98) 2.12	(73.17) 2.10	-0.02
2. Wage labour			
Male	(4.30) 0.12	(6.27) 0.18	+0.06
Female	-	-	-
Total	(4.30) 0.12	(6.27) 0.18	+0.06
3. Service			
Male	(15.05) 0.42	(19.16) 0.55	+0.13
Female	(1.08) 0.03	(0.70) 0.02	-0.01
Total	(16.13) 0.45	(19.86) 0.57	+0.12
4. Petty Business			
Male	(0.72) 0.02	(0.70) 0.02	-
Female	-	-	-
Total	(0.72) 0.02	(0.70) 0.02	-
Total			
Male	(58.42) 1.63	(60.28) 1.73	+0.10
Female	(41.58) 1.16	(39.72) 1.14	-0.02
Total	(100) 2.79	(100) 2.87	+0.08

Note: Figures in brackets are percentages of the total workers.

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.3.1: Past and present average annual income and employment of those households who were given land for land.

(per household)

Activities	Past 1996		Present 2002	
	Employment (days)	Income (Rs)	Employment (days)	Income (Rs)
1. Agriculture	100 (25.45)	9,111 (20.15)	103 (18.73)	4444 (4.14)
2. Daily Wage Labour	50 (12.72)	3333 (7.37)	81 (14.73)	6,111 (5.69)
3. Service	243 (61.83)	32,778 (72.48)	325 (59.09)	91,534 (85.21)
4. Petty Business	-	-	41 (7.45)	5333 (4.96)
Total	393 (100.00)	45,222 (100.00)	550 (100.00)	10,7,422 (100.00)

Note: The figures in parentheses denote percentages to the total.

Source: Sample survey of PAFs in Impact Assessment Study, 2002

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Table-3.3.2: Past and present average annual income and employment of those households who got alternative house or cash compensation for house construction.
(Per household)

Activities	Past 1996		Present 2002	
	Employment (days)	Income (Rs)	Employment (days)	Income (Rs)
1. Agriculture	182 (51.70)	19,933 (70.35)	77 (28.31)	8,933 (17.54)
2. Daily Wage Labour	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
3. Service	97 (27.56)	2,000 (7.06)	170 (62.5)	33,733 (66.23)
4. Petty Business	73 (20.74)	6,400 (22.59)	25 (9.19)	8267 (16.23)
Total	352 (100.00)	28333 (100.00)	272 (100)	50,933 (100.00)

Note: The figures in parentheses denote percentages to the total.
Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table- 3.3.3: Past and present annual income and employment of those households who were allotted alternative shop plots.
(Per household)

Activities	Past 1996		Present 2002	
	Employment (days)	Income (Rs)	Employment (days)	Income (Rs)
1. Agriculture	44 (11.46)	2800 (3.57)	21 (5.44)	2000 (1.10)
2. Service	24 (6.25)	6400 (8.01)	24 (6.22)	72000 (39.76)
3. Petty Business	316 (82.29)	70667 (88.48)	341 (88.34)	107107 (59.14)
Total	384 (100.00)	79867 (100.00)	386 (100.00)	181107 (100.00)

Note: The figures in parentheses denote percentages to the total.
Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.3.4: Past and present annual income and employment of those households who were given employment in the project.
(Per household)

Activities	Past 1996		Present 2002	
	Employment (days)	Income (Rs)	Employment (days)	Income (Rs)
1. Agriculture	570 (67.00)	26028 (37.79)	100 (16.64)	8772 (7.61)
2. Daily Wage Labour	-	-	51 (8.49)	2646 (2.31)
3. Service	281 (33.00)	42,846 (62.21)	394 (65.56)	96,308 (83.92)
4. Petty Business	-	-	5 (9.32)	7077 (6.17)
Total	851 (100.00)	68,874 (100.00)	601 (100.00)	1,14,803 (100.00)

Note: The figures in parentheses denote percentages to the total.

Source: Sample survey of PAFs in Impact Assessment Study, 2002

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Table- 3.3..5: Past and present average annual income and employment of those of households who got cash compensation only.

(Per household)

Activities	Past 1996		Present 2002	
	Annual Employment (days)	Annual Income (Rs)	Annual Employment (days)	Annual Income (Rs)
1. Agriculture	153.25 (43.81)	32500 (41.84)	152.25 (37.97)	39067 (39.57)
2. Daily Wage Labour	27.67 (7.91)	2167 (2.79)	35.83 (8.94)	4367 (4.42)
3. Service	164.25 (46.95)	42043 (54.13)	206.83 (5.16)	53287 (53.98)
4. Petty Business	4.67 (1.33)	967 (1.24)	6.08 (1.52)	2000 (2.03)
Total	349.84 (100.00)	77677 (100.00)	400.99 (100.00)	98721 (100.00)

Note: The figures in parentheses denote percentages to the total.

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.4.1: Past and Present average residential facilities of those households who were given land for land.

(Per household)

Particulars	Past 1996	Present 2002	Change
Kucha structure (# of rooms)	5.77	0.55	-5.22
Value (Rs)	1,36,889	22,222	-114667
Pucca structure (#. of rooms)	1.33	3.44	+2.11
Value (Rs)	11,667	2,35,555	+2,23,888
% Household with separate kitchen	65	100	+35.00
% Household with separate bath	16	100	+84.00
% Household with separate latrine	6	100	+94.00

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.4.2: Past and present average residential facilities of that category of households who got alternative house or cash compensation for house construction.

(Per household)

Particulars	Past 1996	Present 2002	Change
Kucha structure (# of rooms)	3.07	0.13	-2.94
Value (Rs)	1,05,667	1,333	-108,334
Pucca structure (# of rooms)	0.53	4.80	+4.27
Value (Rs)	33,333	2,67,667	+234334
% Household with separate kitchen	73	90	+17
% Household with separate bath	23	40	+17
% Household with separate latrine	20	35	+15

Source: Sample survey of PAFs in Impact Assessment Study, 2002

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Table-3.4.3: Changes in average residential facilities those households who were allotted alternative shop plots.

(Per Household)

Particulars	Past 1996	Present 2002	Change
Kucha structure (# of rooms)	1.80	0.13	-1.67
Value (Rs)	40,000	1333	-38667
Pucca structure(# of rooms)	0.53	2.67	+2.14
Value (Rs)	36,667	84667	+48000
% Household with separate kitchen	65	87	+22
% household with separate bath	19	40	+21
% Household with separate latrine	17	40	+23

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.4.4: Past and present average residential facilities of those households who were given employment in the project.

(Per household)

Particulars	Past 1996	Present 2002	Change
Kucha structure (# of rooms)	1.84	2.07	+0.23
Value (Rs)	64,846	1,12,538	+47692
Pucca structure(# of rooms)	1.85	3.15	+1.39
Value (Rs)	71553	1,35,000	+63447
% Household with separate kitchen	50	61	+11
% household with separate bath	8	53	+45
% Household with separate latrine	3	51	+48

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.4.5: Past and present average residential facilities of those households who got cash compensation only.

(Per household)

Particulars	Past 1996	Present 2002	Change
Kucha structure (# of rooms)	4.02	4.34	+0.32
Value (Rs)	1,34,567	1,50,484	+15917
Pucca structure (# of rooms)	0.25	1.55	+1.33
Value (Rs)	10083	58032	+47949
% Household with separate kitchen	72	89	+17
% household with separate bath	25	37	+12
% Household with separate latrine	18	28	+10

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.5.1: Past and present commercial assets and income accrued from them on those households who were given land for land.

Particulars	Past 1996	Present 2002	Change
1. Taxi:			
No.	-	4	+4
Income/Year	-	60,000	+60,000
2. Lorry:			
No.	1	-	-1
Income/Year	1,80,000	-	-1,80,000
3. General Store:			
No.	1	-	-1
Income/Year	16000	-	-16000

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.5.2: Past and present commercial assets and income accrued from them on those households who were allotted alternative shop plots.

Particulars	Past 1996	Present 2002	Change
1. Taxi			
No.	1	1	0.00
Income/Year	1,40,000	1,50,000	+10,000
2. Lorry			
No.	-	2	+2
Income/Year	-	1,90,000	+1,90,000
3. Tea Shop			
No.	3	3	0.00
Income/Year	20,000	15000	-5000
4. General Store			
No.	1	1	0.00
Income/Year	90,000	96,000	+6000
5. Other			
No.	1	2	+1
Income/Year	30,000	24,000	-6000

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.5.3: Past and present commercial assets and income earned from them by those households who were given employment in the project.

Particulars	Past 1996	Present 2002	Change
1. Taxi			
No.	-	-	-
Income/Year (Rs)	-	-	-
2. Lorry			
No.	1		-1
Income/Year (Rs)	90,000		-90,000

Source: Sample survey of PAFs in Impact Assessment Study, 2002

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Table-3.5.4: Past and present commercial assets and income accrued from them by those households who got cash compensation only.

Particulars	Past 1996	Present 2002	Change
1. Taxi			
No.	1	1	-
Income/Year	9900	1,80,000	+170100
2. General Store			
No.	-	2	+2
Income/Year	-	30,000	+30,000
3. Photo Copier			
No.	-	1	+1
Income/Year	-	2400	+2400

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.6.1 (a): Change in Livestock assets on those households who were given land for land.

(Number/Household)

Livestock	Past 1996	Present 2002	% Change
1. Cows:			
No.	3.11	1.1	-64.63
Value (Rs)	3789	4222	+11.43
Output (Rs)	1355	700	-48.34
2. Bullock:			
No.	1.56	0.56	-64.10
Value (Rs)	1489	744	-50.03
Output (Rs)	950	284	-70.10
3. Sheep/ goats:			
No.	22.34	3.33	-85.09
Value (Rs)	10555	3779	-64.19
Output (Rs)	109	29	-73.39

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.6.1(b): Sale and purchase of livestock on those households who were given land for land.

(Per Household)

Particulars	Cows		Bullocks	Sheep	Goats	Total
	Indigenous	CB				
Sale:						
Number	0.33	-	0.22	3.00	3.33	6.88
Value (Rs)	333	-	133	2778	3333	6577
Purchase:						
Number	0.11	0.11	-	-	-	0.22
Value (Rs)	111	556	-	-	-	667

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.6.2 (a): Change in livestock assets of those households who got alternative house or cash compensation for house construction.

(Number/Household)

Livestock	Past 1996	Present 2002	Change
1. Cows:			
No.	3.13	1.53	-51.12
Value (Rs)	8,600	4,484	-47.86
Output (Rs)	7,160	1,552	-78.32
2. Bullock:			
No.	1.53	0.33	-78.43
Value (Rs)	1,760	433	-75.39
Output (Rs)	330	220	-33.33
3. Sheep/ goats:			
No.	8.53	-	-100.00
Value (Rs)	12033	-	-100.00
Output (Rs)	270	-	-100.00

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.6.2(b): Sale and purchase of livestock of those households who got alternative house or cash compensation for house construction.

(Per Household)

Particulars	Cows		Bullocks	Sheep	Goats	Total
	Indigenous	CB				
Sale:						
Number	1.20	0.27	0.73	8	-	10.20
Value (Rs)	9,867	1,533	700	4,000	-	1,61,000
Purchase:						
Number	0.07	-	-	-	-	0.07
Value (Rs)	80	-	-	-	-	80

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.6.3(a): Change in livestock assets on those households who were allotted alternative shop plots.

(Per Household)

Livestock	Past 1996	Present 2002	Change
1. Cows:			
No.	0.46	0.14	-69.65
Value (Rs)	1200	366	-69.50
Output (Rs)	1042	2424	+132.62
2. Bullock:			
No.	0.27	-	-100.00
Value (Rs)	833	-	-100.00
Output (Rs)	250	-	-100.00
3. Sheep/ goats:			
No.	8.67	-	-100.00
Value (Rs)	15000	-	-100.00
Output (Rs)	285	-	-100.00

Source: Sample survey of PAFs in Impact Assessment Study, 2002

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Table-3.6.3 (b): Sale and purchase of various livestock on those households who were allotted alternative shop plots.

(Per Household)

Particulars	Cows		Bullocks	Sheep	Goats	Total
	Indigenous	CB				
Sale	-	-	-	-	-	-
Purchase	-	-	-	-	-	-
Number	-	0.07	-	-	-	0.07
Value (Rs)	-	333	-	-	-	333

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.6.4(a): Change in livestock assets of those households who were given employment in the project.

(Per Household)

Livestock	Past 1996	Present 2002	% Change
1. Cows:			
No.	1.69	0.69	-59.17
Value(Rs)	2735	2569	-6.07
Output(Rs)	729	1172	60.77
2. Bullock:			
No.	1.23	0.08	-93.49
Value(Rs)	1654	38	-97.70
Output(Rs)	427	46	-89.23
3. Sheep/ goats:			
No.	8.08	0.39	-95.17
Value(Rs)	7538	385	-94.89
Output(Rs)	1914	46	-97.60

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.6.4 (b): Sale and purchase of livestock on those households who were given employment in the project.

(Per Household)

Particulars	Cows		Bullocks	Sheep	Goats	Total
	Indigenous	CB				
Sale						
Number	0.77	-	0.54	9.62	1.54	12.47
Value (Rs)	600	-	502	1923	1538	4563
Purchase						
Number	0.16	-	-	-	-	0.16
Value (Rs)	169	-	-	-	-	169

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.6.5(a): Change in livestock assets of those households who got cash compensation only.

(Per Household)

Livestock	Past 1996	Present 2002	% Change
1. Cows			
No.	2.17	1.57	-27.64
Value (Rs)	4,353	11,313	+159.89
Output (Rs)	14160	13,686	-3.34
2. Bullock			
No.	1.00	0.63	-37.00
Value (Rs)	1070	637	-40.46
Output (Rs)	1320	788	-40.30
3. Sheep/ goats			
No.	20.66	0.73	-96.47
Value (Rs)	23,467	917	-96.09
Output (Rs)	690	39	-94.34

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.6.5 (b): Sale and purchase of livestock on those households who got cash compensation only.

(Per Household)

Particulars	Cows		Bullocks	Sheep	Goats	Total
	Indigenous	CB				
Sale						
Number	0.65	0.02	0.37	14.20	5.90	21.14
Value (Rs)	578	133	307	11,600	5725	18,343
Purchase						
Number	0.02	0.03	-	-	-	0.05
Value (Rs)	8	250	-	-	-	258

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.7.1: Past and present land resources and cropping pattern of those households who were given land for land.

(Area in hectare)

Land use & crops grown	Past 1996	Present 2002	Change
Total land	1.380	0.58	-0.80
Grassland	0.117	-	-0.117
Orchard	0.205	-	-0.205
Cultivated land	1.058	0.58	-0.478
Net sown area	1.058	0.580	-0.478
Cropped Area	1.416	0.894	-0.522
Maize	0.560	0.458	-0.102
Rice	0.115	0.000	-0.115
Wheat	0.502	0.374	-0.128
Barley	0.089	0.000	-0.089
Pulses	0.150	0.062	-0.088

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.7.2: Past and present land resources and Cropping pattern of those households who got alternative house or cash compensation for house construction.
(Area in hectare/Household)

Land use & crops grown	Past 1996	Present 2002	Change
Total land	1.013	0.190	-0.823
Grassland	0.085	0.00	-0.085
Orchard	0.224	0.021	0.203
Cultivated land	0.704	0.169	0.535
Net sown area	0.928	0.190	-0.819
Cropped Area	1.132	0.244	-0.888
Maize	0.160	0.064	-0.328
Rice	0.414	0.054	-0.106
Wheat	0.080	0.072	-0.342
Barley	0.080	0.048	-0.032
Pulses	0.086	0.006	-0.080

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.7.3: Past and present land resources and cropping pattern of those households who were allotted alternative shop plots.
(Area in hectare/Household)

Land use & crops grown	Past 1996	Present 2002	Change
Total land	0.042	0.0422	-0.0002
Grassland	-	-	-
Orchard	-	-	-
Cultivated land	0.042	0.042	0.00
Net sown area	0.042	0.042	0.00
Cropped Area	0.080	0.054	-0.026
Maize	0.026	0.022	-0.004
Rice	0.006	-	-0.006
Wheat	0.032	0.026	-0.006
Barley	0.006	-	-0.006
Pulses	0.010	0.006	-0.004

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.7.4: Past and present land resources and cropping pattern of those households who were given employment in the project.
(Area in hectare/Household)

Land use & crops grown	Past 1996	Present 2002	Change
Total land	0.710	0.422	-0.289
Grassland	0.030	0.000	-0.030
Orchard	0.090	0.037	-0.053
Cultivated land	0.590	0.385	-0.205
Net sown area	0.590	0.385	-0.205
Cropped Area	0.931	0.456	-0.475
Maize	0.363	0.295	-0.068
Rice	0.570	0.012	-0.558
Wheat	0.348	0.106	-0.242
Barley	0.185	0.000	-0.185
Pulses	0.043	0.006	-0.037

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.7.5: Past and present land resources and cropping pattern of those households who got cash compensation only.

(Area in hectare/Household)

Land use & crops grown	Past 1996	Present 2002	Change
Total land	0.712	0.454	-0.258
Grassland	0.010	0.006	-0.004
Orchard	0.162	0.148	-0.014
Cultivated land	0.540	0.30	-0.24
Net sown area	0.702	0.448	-0.254
Cropped Area	0.804	0.494	-0.31
Maize	0.320	0.194	-0.126
Rice	0.076	0.038	-0.038
Wheat	0.310	0.202	-0.108
Barley	0.026	0.010	-0.016
Pulses	0.072	0.050	-0.022

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.8.1: Change in yield rate of various crops on those households who were given land for land.

(Quintals per hectare)

Crops	Past 1996	Present 2002	% change
Maize	11.125	11.625	4
Paddy	15.625	-	-
Wheat	9.875	10.375	5
Barley	10.250	0.00	-
Pulses	5.625	6.000	6
Plum	130.375	141.750	9

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.8.2: Change in yield rates of various crops on those households who got alternative house or cash compensation for house construction.

(Quintals per hectare)

Crops	Past 1996	Present 2002	% change
Maize	11.500	12.000	4
Paddy	10.625	9.375	-12
Wheat	9.750	9.625	-1
Barley	11.125	10.750	-3
Pulses	6.125	6.625	8
Plum	-	-	-
Apple	43.750	20.625	-53
Peas	5.625	5.500	-2

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.8.3: Changes in yield rates of various crops of those households who were allotted alternative shop plots.

(Quintals per hectare)

Crops	Past 1996	Present 2002	% change
Maize	12.500	11.625	-7
Paddy	21.250	-	-
Wheat	7.125	6.125	-14
Barley	8.375	-	-
Pulses	15.625	8.500	-46

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.8.4: Changes in yield rates of various crop of those households who were given employment in the project.

(Qtls/ hectare)

Crops	Past 1996	Present 2002	% change
Maize	15.500	21.365	38
Paddy	9.635	7.692	-20
Wheat	9.471	16.221	71
Pulses	5.990	2.404	-60
Apple	58.462	42.923	-27

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.8.5: Changes in yield rates various crops of those households who got cash compensation only.

(Quintals per hectare)

Crops	Past 1996	Present 2002	% change
Maize	17.625	19.125	9
Paddy	17.500	17.250	-1
Wheat	12.875	13.750	7
Barley	14.500	15.000	3
Pulses	7.375	7.500	2
Plum	120.625	135.250	11
Apple	78.750	85.250	8

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.9.1: Past and present average monthly consumption expenditure of those households who were given land for land.

(Per Household)

Items	Past 1996		Present 2002		% change
	Qty. (Kg)	Value (Rs)	Qty. (Kg)	Value (Rs)	
Cereals	88	825	96	949	9.09
Pulses	10	282	10	228	0.00
Oil/ Ghee	5	246	6	360	20.00
Milk	100	1022	69	779	10.00
Vegetables	13	177	26	307	100.00
Fruits	8	118	14	199	75.00
Meat	3	264	5	344	66.67
Liquor	-	21	-	50	138
Medicines	-	16	-	22	40.55
Cloths	-	224	-	249	10.81
Footwear	-	101	-	117	15.04
Education	-	79	-	107	34.52
Per capita expenditure	-	663	-	831	

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table3.9.2: Past and present average monthly household consumption expenditure of those households who got alternative house or cash compensation for house construction.

(Per Household)

Items	Past 1996		Present 2002		% change
	Qty. (Kg)	Value (Rs)	Qty. (Kg)	Value (Rs)	
Cereals	73	815	68	570	-30.12
Pulses	7	143	8	143	14.28
Oil/ Ghee	4	207	9.81	700	0
Milk	96	960	98	1000	2.08
Vegetables	7.7	75	20	195	159.7
Fruits	7.3	128	11	79	43.84
Meat	5	313	2	107	-70.00
Liquor	-	57	-	73	28.07
Medicines	-	15	-	14	-5.50
Cloths	-	336	-	263	-21.87
Footwear	-	67	-	103	53.73
Education	-	102	-	232	127.45
Per capita expenditure	-	548	-	581	

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.9.3: Past and present average monthly consumption expenditure of those households who were allotted alternative shop plots.

(Per Household)

Items	Past 1996		Present 2002		% change
	Qty. (Kg)	Value (Rs)	Qty. (Kg)	Value (Rs)	
Cereals	97	1058	67	689	-30.92
Pulses	8	222	9	228	12.50
Oil/ Ghee	5	325	5	255	0.0
Milk	83	842	93	504	12.05
Vegetables	16.87	232	22	206	29.41
Fruits	7	147	8	169	14.29
Meat	1	135	2	170	100.00
Liquor	-	73	-	93	27.31
Medicines	-	27	-	13	-51.67
Cloths	-	387	-	309	-20.16
Footwear	-	110	-	492	346.82
Education	-	176	-	186	5.68
Per capita expenditure	-	675	-	675	-

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.9.4: Past and present monthly consumption expenditure of those households who were given employment in the project.

(Per Household)

Items	Past 1996		Present 2002		% change
	Qty. (Kg)	Value (Rs)	Qty. (Kg)	Value (Rs)	
Cereals	71	780	76	864	7.04
Pulses	9	171	9	173	0.00
Oil/ Ghee	4	226	4	270	0.00
Milk	37	364	47	422	27.03
Vegetables	12	272	14	365	16.67
Fruits	9	162	12	209	33.33
Meat	3	212	4	143	33.33
Liquor	-	81	-	110	35.80
Medicines	-	13	-	14	7.69
Cloths	-	205	-	175	-14.63
Footwear	-	100	-	213	113.00
Education	-	102	-	133	30.39
Per capita expenditure	-	483	-	564	16.77

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Appendices

Table-3.9.5: Past and present average monthly consumption expenditure of those households who got cash compensation only.

(Per Household)

Items	Past 1996		Present 2002		% change
	Qty. (Kg)	Value (Rs)	Qty. (Kg)	Value (Rs)	
Cereals	59.63	632	66.65	758	11.77
Pulses	4.57	204	8.5	273	86.00
Oil/ Ghee	4.18	211	6.03	287	44.26
Milk	68.10	681	101.1	960	48.46
Vegetables	9.73	144	17.85	299	83.45
Fruits	6.95	97	8.57	137	23.31
Meat	3.7	267	4.77	413	28.92
Liquor	1.53	109	1.83	144	19.61
Medicines	-	12	-	18	47.55
Cloths	-	300	-	346	15.25
Footwear	-	146	-	186	26.27
Education	-	190	-	248	30.49
Per capita expenditure	-	558	-	759	36.02

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.10.1: Average investment made out of the cash compensation received by those households who were given land for land.

Use of cash compensation	Average amount used (Rs/Household)	% age
Purchase of land	2,80,888	65.53
Purchase of taxi	44,444	10.37
House construction	1,03,333	24.10
Total	4,28,665	100.00

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.10.2: Per households average amount invested out of the cash compensation received by those households who got alternative house or cash compensation.

Use of cash compensation	Average amount used (Rs/Household)	% age
Purchase of land	51,667	19.74
Bank deposit	53,667	20.50
House construction	1,37,733	52.61
House repair	7,733	2.95
Consumption	11000	4.20
Total	2,61,800	100.00

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Appendices

Table-3.10.3: Average amount invested out of the cash compensation by those households who were allotted alternative shop plots.

Use of cash compensation	Average amount used (Rs/Household)	% age
Purchase of land	42,667	46.48
House construction	23467	25.56
Consumption	25,667	27.96
Total	91,801	100.00

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.10.4: Average amount invested out of cash compensation by those households who got employment in the project.

Use of cash compensation	Average amount used (Rs/Household)	% age
Purchase of land	14,279	4.19
Purchase of shop	5,769	1.69
Bank deposit	2,61,817	76.81
House construction	52,538	15.41
House repair	4,000	1.17
Consumption	2,462	0.72
Total	3,40,865	100.00

Source: Sample survey of PAFs in Impact Assessment Study, 2002

Table-3.10.5: Utilization of cash compensation received per households by those households who got cash compensation only.

Use of cash compensation	Average amount used (Rs /Household)	% age
Purchase of land	19,244	27.28
Land improvement	67	0.09
Purchase of shop	2500	3.54
Education	2000	2.84
Bank deposit	10,067	14.27
Repayment of old debt	612	0.87
House construction	23,700	33.61
House repair	3,594	5.10
Purchase of cattle	100	0.14
Consumption	8640	12.25
Total	70524	100.00

Source: Sample survey of PAFs in Impact Assessment Study, 2002