Advantages of hydro generation: Resettlement of Indigenous Bote (Fisherman) families: A Case Study of Kali Gandaki "A" Hydroelectric Project of Nepal

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Abstract

Hydropower is one of the cleanest, renewable and environmentally benign sources of energy. Nepal is blessed with immense source of water resources and huge hydropower potential. Kali Gandaki 'A' Hydroelectric Project (KGAHEP) is the largest hydropower project constructed so far in Nepal. The Project is daily pondage type scheme with an installed capacity of 144 MW.

Implementation of KGAHEP in the region, once considered as remote area, has resulted multifold beneficial impacts to the local community. Improvement of public infrastructure enhanced educational facilities and employment of local population including affected families during project construction and operation phase have enhanced quality of rural lives.

Bote are indigenous fishermen community of Nepal. A small community of Bote families is living at headwork site of Project. Boating, fishing and working as bonded labor were their traditional occupation. They were socially marginalized, downtrodden and extremely poor people. Their low status in society and low level of education deprives them of any public influence and always receive very little support and recognition in mainstream society.

The implementation of the KGAHEP has caused impacts on these Bote families seriously. They fall under the category, as per project definition, of SPAF (Seriously Project Affected Families). They lost their houses, cowshed and land by the acquisition for project. The risks of impoverishing these affected Bote families further through their displacement were severe. But impoverishment risks associated with the displacement were transformed into the opportunities for reconstruction of their livelihood with permanent housing, sustainable income sources, and social development; enhance literacy and access to education for their children. Establishment of a Primary School for their children near village is an important gesture of project mitigation attempts for these Bote communities. Besides, operation of steamer and fishing in reservoir created by project has provided them additional opportunities for their sustainable livelihood.

1 BACKGROUND

Hydropower is one of the cleanest, renewable and environmentally benign sources of energy. Nepal is blessed with immense source of water resources and huge hydropower potential. Nepal possesses the second largest potential of water resources in the world to generate hydroelectricity. Kali Gandaki "A" Hydroelectric Project of 144 MW (KGA-HEP) is the largest hydropower project constructed so far in Nepal.

The Project (KGA-HEP) lies about 180 km west of Kathmandu, the capital city of Nepal. The project is a daily pondage type scheme located on the Kali Gandaki River with an installed capacity of 144 MW. The
The project generates about 842 GWh of electric energy annually by utilizing a net head of 115 m. The main structures of the project are concrete gravity diversion dam of about 100 meter length and 43 m height, open surface desander, headrace tunnel of about 6 km in length and 7.4 m diameter and a surface powerhouse. The rated discharge of 141 m$^3$/s feeds three Francis type turbines in the powerhouse. The surface area of reservoir is 65 ha followed by 5.3 km long back water level. The dam and powerhouse is located at Shree Krishna Gandaki and Jagatra Devi Village Development Committee (VDC) of Syangja District respectively. Permanent camps are located at Beltari and Mirmi of Shree Krishna Gandaki VDC.

The feasibility study of the project was carried out in 1979 with the financial assistance from United Nations Development Program (UNDP) which was updated in 1991. The detailed engineering design and preparation of tender documents commenced in 1993 with the financial assistance of Asian Development Bank (ADB), UNDP and Finnish International Development Agency (FINNIDA) jointly. The preparatory works like access road construction was started in 1993 with internal resources from Government of Nepal (GoN) and Nepal Electricity Authority (NEA).

The construction of hydropower component was started in 1997 under the loan assistance of Asian Development Bank (ADB) and Overseas Economic Corporation Fund (OECF) now known as Japan Bank for International Cooperation (JBIC). Morrison Knudsen International Inc. USA was the project engineers. Besides, the local currency expense was borne by the Government of Nepal and Nepal Electricity authority. The project construction work was completed in 2002. The generation unit was tested in May 2002 and commercial production was started from August 2002.

The power generated from the project by 3 units of turbines of 48 MW each capacity is evacuated to the central grid via 132 kV single circuit 66 km long transmission line to Pokhara and 44 km double circuit transmission line to Butwal. A sub-station is constructed in Lekhnath Municipality of Kaski district whereas existing Jogikutì substation of Butwal has been upgraded.

The experience in Kali Gandaki "A" Hydroelectric Project shows that the social factors, among others, have been one of the important factors than initially anticipated for the smooth advancement of engineering work and fruitfully completion of the Project.

### 2 ENVIRONMENTAL STUDIES

From the initial stage of the project, environmental concerns were the integral part of design optimization. The Environmental Impact Assessment (EIA) study was conducted in 1996 according to National EIA Guidelines 1993 and Asian Development Bank Guidelines (1990). The interaction and consultation programs during project preparation stage reflected views of different stakeholders, which were considered in the detail design phase of the project and possible adverse environmental impacts were avoided to the extent possible.

Primary environmental documents prepared during engineering design and tender documents preparations stage that has guided environmental activities of the project are as follows;

- Mitigation Management and Monitoring Plan, 1996 (MMMP)
- Acquisition, compensation and Rehabilitation Plan, 1996 (ACRP)
- Tender Documents with Conditions of Particular Applications; Social and Environmental clauses
- Summary Environment Impact Assessment, ADB, 1996 (SEIA)
- Report and Recommendation of President to Board of Directors, ADB 1996 (RRP - NEP 26362)
- Loan Agreement with ADB

The EIA explains the impacts and proposed mitigation measures as identified during the detail study of the project and provides justification for the mitigation. The MMMP describes how the mitigation spelled out in the EIA, ACRP and Tender Clauses will be carried out. The MMMP provides guide to mitigation management and the environmental monitoring. The main objective of ACRP is to insure that people affected by the project related property and land takings will be as well off after the project as they were before. The Tender Documents specify what action construction contractors are required to take to protect
the environment. In addition, the contractors were required to develop the Environmental Protection Plan, Health and Safety Plan and Muck/Waste Management Plan. Contractors disturbing vegetation were required to submit a Revegetation Plan. These Plans augment the MMMP and specified how the contractors met and implemented environmental mitigation requirement specified in the EIA, ACRP and the Tender Documents.

The loan document between ADB and NEA defines the role, responsibility and mandate of Kali Gandaki Environmental Management Unit (KGEMU) established within the office of the Project Engineers. The loan document includes basic provisions in environmental aspects, which are to be carefully addressed to comply with ADB policies and procedures. Institutional requirement for monitoring, establishment of KGEMU, provision for construction stage Panel of Experts on environmental and social aspects (PoE), implementation of MMMP, contractors compliance with tender clauses, compensatory flow of $4 \text{ m}^3/\text{s}$, operation of fish hatchery, minimize amount of resettlement, enable the communities to benefit from the project, preferential hiring and need of public consultation are included in this document.

### 3 SOCIAL MITIGATION POLICY

The resettlement policy defined in Project documents provides that Government of Nepal and NEA “shall take or cause to be taken all necessary measures to ensure that all the population adversely affected by carrying out the project shall generally:

i. improve or at least regain their prior standard of living
ii. be relocated, if necessary, in accordance with their preferences and be fully integrated into the community in which they move; and
iii. be provided with appropriate, agreed upon compensation and required physical rehabilitation of infrastructures, community facilities, including rehabilitation grants, skill training and employment opportunities. All such measures should at least satisfy the requirement of the ACRP.

### 4 ROLE OF PANEL OF EXPERTS

The provision of Panel of Experts\(^1\) was centered essentially on monitoring and assisting the project director and the KGEMU, in the formulation and implementation of social mitigation strategy as well as strengthening the KGEMU's institutional capacity. The PoE including expatriate environmental and social scientist have been supportive and provided their in-depth analysis and guidance to the project and the KGEMU during the construction phase of the project.

### 5 CONCEPTUAL FRAMEWORK

The implementation of large infrastructures projects or dams do have some kinds or other impacts on natural as well as on social environs that results in the loss of land and other resources of the local inhabitants. While development projects have become a blessing to many people, they have also become a curse to others, particularly those who are displaced. The displace people lose capital in all its forms i.e. natural, man-made, human and social. The core issues in population displacement and relocation is the risks of socio-economic impoverishment. Thus, the primary socio-economic concerns in resettlement operation revolve around reducing impoverishment risks and reconstruction of sustainable livelihood for the re-settlers. This risks can be controlled and reversed, or at least mitigated, by an integrated reconstruction and reestablishment strategy, adequately financed and purposively targeted against each one of them (Cernea 1997 a).

In recent time, dam development has been largely contested because of the issues of displacement and resettlement associated with its implementations. These issues, therefore, have been a prominent focus of the current research around the world. Indigenous people are more vulnerable to environmental stress and impacts since their livelihood heavily depends on natural resources. They are likely to suffer adverse consequences resulting in social and psychological trouble, and often long-term economic impoverishment.

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\(^1\) International Panel of Experts includes Professor Michael M Cernea for Social and Dr. D., Graybill for environmental aspects.
Displacement from development often raises ethical questions because of the inequitable distribution of benefits and losses where state interventions may end up with the vulnerable being worse off (Cernea 2000).

Development theories proclaim the goal of poverty reduction. Hence, displacement caused by the development activities must be turn into development opportunities to ensure environmental justice and social equity. It is the responsibility of the state to ensure that no one in the affected area of the development project is victimized while the large welfare of the society is being fulfilled. Involuntary resettlement will remain a formidable challenge, but a challenge that can and must be met successfully as part of the overall development process (Cernea HRW Dec. 1997).

Within this conceptual framework, this paper is prepared on how the implementation of large hydropower project by building dams affected local indigenous people and how the mitigation strategies implemented have contributed to the socio-economic enhancement of the affected indigenous Bote families in Kali Gandaki "A" Hydroelectric Project of Nepal.

6 ABSENCE OF POLICY

Nepal does not have a National Policy on Involuntary resettlement caused by development projects. Absence of a national policy setting standards in involuntary displacement and relocation operation, defining the rights and entitlement of the affected people, the obligation of the agencies performing displacement and the mitigation necessary for rebuild disrupted livelihood has posed severe limitation in development and implementation of successful resettlement program. An ADB TA 4422 NEP is under implementation to prepare "National Policy on Land Acquisition, Compensation and Resettlement in Development Project” in Nepal.

Policy should ensure that the affected people that depends on natural resources shall given priority access to share some of the immediate benefits created by the very project that caused displacement. Good resettlement can prevent the impoverishment of people displaced by the construction of hydroelectric project (Cernea HRW Dec. 1997).

6.1 The Bote (Fisherman) Community

Bote are an indigenous, socially marginalized and vulnerable poor community of Nepal whose livelihood and culture are closely associated with the river. They are also called Majhi and Ghatwar, the first means fisherman and the later means man who ferry boat. They are found residing in small community along the bank of several rivers in Nepal, particularly in the tributaries of Sapta Gandaki. They are occupational group of fisherman and boat transportation. Bote depend heavily on the river for their livelihood. Fishing, boating and working as wage labor in the field of local’s elite are their traditional occupation. The boating occupation of Bote community has been affected after numerous suspension bridges were constructed in most of the rivers of Nepal. Fishing in the river also affected by various infrastructures development project specifically hydropower and the irrigation project that require damming of the rivers. As a result of that most of the Bote had to shift their traditional occupation to other means.

A small community of Bote families is living near the headwork site of the Kali Gandaki "A" Hydroelectric Project along the bank of Andhi Kholra river in Andhimuhan village of Shree Krishna Gandaki VDC of Syangja district of Nepal. As per elders Bote people, their ancestors had migrated from other places since 100 years back. Most of the houses of the Bote families are made of mud mortal with thatched roof and constructed at close clustered within the village.

The Bote community residing in small community along the Kali Gandaki and Andhimuhan River (Upstream of the Dam up to Myagdi, Dam through Powerhouse and Downstream of Powerhouse up to 15 km) include approximately 245 families. These settlements are located in 5 districts of 3 zones in 23 villages of 21 VDCs and 1 Municipality. The Bote families residing upstream and downstream of the

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2 This is third ADB TA provided for the preparation of Policy on Involuntary Resettlement in Nepal.
Project are not directly affected by land take and house expropriation. Hence, this paper deals with the resettlement of directly affected Bote families residing at Andhimuhan village near project headwork site.

6.1.1. Impact on Bote Families

A small group of Bote (fisherman) families residing along the bank of Andhikhola river near the confluence of Kali Gandaki and Andhikhola river of Syangja District were seriously affected by the acquisition of their houses, cowshed and land for the project access road, contractors camps, reservoir and suspension bridges resulting displacement and relocation during various stages of project construction. 3 Bote families had to relocate twice for the project. Lack of education, income and the enabling opportunities were main reason that created difficulties to Bote families with the adjustment during the project construction period.

MMMP could not foresee the additional impacts on Bote community since additional acquisition of land (leasing the land) and expropriation of houses by the Project main civil contractor occurred during the implementation phase without prior provisions. This additional acquisition has resulted the displacement of 10 Bote families. Some of the Bote families who were displaced by the Project main civil contractor relocated themselves in and around the Project inundation area within their village.

During the visits of PoE, several discussion meeting were held among the Project staff and the PoE members with regard to mitigation measure to these affected Bote families. As a result of discussion and the recommendation of PoE, various impact studies were carried out incorporating major social and economic impoverishment variables. More than 80 percent of affected families of Bote community at Andhimuhan village were categorized as SPAF3.

The poor and vulnerable Bote community needs special attention toward mitigation of project impacts in comparison to other community of the project area. These Bote do not have the capacity to absorb adverse impacts and share the project benefit without significant help. Hence, based on the studies, KGEMU with the help of POE prepared and implemented a Resettlement and Rehabilitation Plan for affected Bote Families to avoid risks of impoverishment.

6.1.2 Loss of Land/houses/cowshed

The Kali Gandaki "A" Hydroelectric Project acquired houses/cowshed and lands from the Bote families of Andhimuhan village of SKG and Nibuwakhark VDC for the implementation of the Project with specific purposes as follows:

Project access road

Before the implementation of the project, NEA acquired the houses from 8 Bote families of Bote Village of SKG VDC at headwork site for the construction of pre-requisite project access road in 1993. These affected Bote families were relocated with financial assistance by the Project/NEA in their village along the Andhi Khola river. An compensation amount of NRs. 209,215.00 was paid to these 8 household at replacement cost for their houses and cowsheds with the housing material to re-use in reconstruction of houses. The Project had given the compensation money in installment basis based upon the completion of new houses for their relocation in order to protect the misuse of money and going to the local money lender of which these Bote were in debt. This mechanism had confirmed the relocation of these displaced Bote families without risk of being impoverished from homelessness.

Reservoir area

The Bote village is situated along the banks of Andhi Khola river in upstream reservoir area of the Project Dam site. Hence, lands were acquired from the local communities including Bote families and the Guthi for the reservoir along the Andhi Khola river. Approximately 8-6-0-3 (1 ha – 19.66 ropani) ropani of lands were acquired in Nibuwakarka VDC from the Bote for this purpose and an amount of NRs. 208,940.00

3 SPAF= Seriously Project Affected Family were those losing their home, more than 60 % of their annual income or more than 50 % of their assets including land.

PAF= Project Affected Family were those affected by project related acquisition of land.
was paid for the compensation to 5 Bote land owners. Besides, 7 Bote families residing or on lands just above or under the inundation level of the reservoir had to be relocated in safe place.

**Central workshop:**
The project main civil contractor, Impregilo S. p. A. has made an agreement with the local residents including the Bote families of Andhimuhan Bote Village for lease of lands to establish its Central Workshop. Approximately 18 ropani of land (30 plots) were taken on lease basis. Altogether 11 houses of Bote and others were also removed from this area. IgL paid an amount of NRs. 25,000 to each of the house owners in 1998. Besides, IgL paid lump sum amount of NRs, 153,885.27 to Bhagawati High School of Mirmi of SKG VDC as lease amount for four years at the rate of NRs. 3,000 per ropani. Out of these amount NRs. 51,044.88 was paid to the house owners.

**Suspension bridge:**
The Project has acquired 3 houses and 1 cowshed from the resident of Bote village to construct new suspension bridge over the Andhi Khola River near Headwork site replacing old one which was below the reservoir level in 2000. A sum of NRs. 154,360 and NRs. 1,544 were paid to owners (4 persons) as compensation for acquired houses and cowshed respectively. Similarly, an area of 0-14-3-3 ropani of land was acquired and NRs. 14,003.00 paid as compensation for the construction of suspension bridge.

Approximately 13 Ropani of land, 21 houses and 7 cowshed were acquired from these vulnerable Bote families of Andhimuhan village for the different components of the project. Altogether 18 SPAFs and 4 PAFs have lost their houses or/and land for the Project. In some cases their houses have been displaced and relocated twice.

Since most of the Botes' houses were built on the Guthi land but without tenancy certificate, there was a problem in properly compensating their assets and resettling them. Hence, NEA provided sufficient compensation in order to help Bote families to reconstruct their houses.

### 6.1.3 Loss of Traditional Occupation

Bote depends heavily on river for their livelihood. They lost their traditional occupation of boating and fishing in the river particularly during the project construction period due to construction related disturbances. The implementation of project has changed their occupation pattern. Now their traditional occupations are replaced by project related jobs, engaged in boating transportation and small business.

### 7 MITIGATION IMPLEMENTATION

It was imperative to give first and foremost priority in assisting these affected Bote families for the restoration and improvement to their livelihood and for protecting these indigenous minority populations. This was the basic policy principle of the major donor (ADB) and was one of the central tasks of KGEMU. The PoE guided the Project Management and the KGEMU throughout the implementation period to initiate and implement effective social mitigation strategies to prevent impoverishment risks and to do research on social and cultural impacts.

The EIA, MMMP and ACRP proposed several mitigation measures to counter the risks associated with the resettlement as follows;

- compensation and rehabilitation grants,
- job training and priority of hiring for affected families, and priority to Bote in fisheries program
- Micro-credit revolving fund
- Agricultural intensification program, and
- Rural electrification program

The project mostly followed the mitigation approaches proposed by the project environmental documents. Nevertheless, the project also espouse to adaptive management approach in order to minimize and/or mitigate the unforeseen adverse impacts arises during the course of project implementation. Resettlement
and Rehabilitation program for affected Bote families and implementation of Community Support Program were good examples of adaptive management of the project.

Some of the major mitigation strategies implemented during construction stage of the project were as follows:

7.1 Resettlement and Rehabilitation Plan for Affected Bote Families:

In compliance with the ultimate goal of the project to ensure the mitigation of project impacts on the livelihood of these marginalized and poor affected Bote families, KGEMU developed and implemented a Resettlement and Rehabilitation Plan for these affected Bote families with guidance from the members of Panel of Experts. Members of Panel of Experts for social aspects provided the greatest impetus with regard to the preparation and implementation of Resettlement and Rehabilitation Plan for these affected Bote families.

The Project/NEA has acquired a plot of 4 ropani\(^4\) of land (1.5 ropani for Primary School for the children of Bote community and 2.5 for housing scheme) near by their village at the Andhimuhan village. Altogether 8 houses (including one house for community center) were constructed by the Project on this plot of land 7 Bote families who were residing in unsafe place in & around the inundation area of Project reservoir level were resettled in these houses. Similarly, additional land at IgL workshop area were acquired by NEA and built 10 additional houses (3 twin houses by NEA and 2 twin houses by IgL) for 10 Bote families who were displaced from their place by the project contractor, IgL. Altogether 17 affected Bote families were resettled in newly built houses with access to electricity and drinking water by the project.

The programs implemented under this plan included:

- Adult Literacy Program,
- Training program on poultry and pig farming,
- Construction of Sheds for Pig Farming,
- Cage and aquaculture training program,
- An amount of NRs. 60,000 had been released as a micro credit to 20 members of Bote families in 4 groups for income generating activities,
- Similarly 8 Bote were employed in Project Fish Trapping and Hauling program and 5 in Project fish hatchery,
- A Primary School established for the children of Bote families.

The implementation of Resettlement and Rehabilitation Plan (RRP) for the affected Bote families resulted many benefit to these vulnerable indigenous minority families affected by repeated resettlement. The RRP comprises various activities that have helped the communities to reconstruct not only their lost livelihood but has also mitigate the risks of impoverishment by house losing. The housing scheme of RRP has ensures quality residence to the affected Bote families with the provision of ownership and legal entitlement. Thus the RRP has ensured the restoration of sustainable livelihood for the affected Bote families.

7.2 Local Employment

The provision of targeted priority hiring in the project contracts has resulted in a high percentage of employment to affected families including these Bote families, generating regular cash income. This has made an enormous difference to the livelihood of affected Bote families and the local rural economy as well. There was no such paid employment opportunity in the area before the project. The Project policy of priority hiring of project affected families (SPAF/PAF) during the Project construction phase has been very effective risk-mitigation strategy in assisting the affected families including the Bote families for the restoration and improvement of their livelihood, which has been fully confirmed. This strategy of securing project job to the affected families has been applied firmly, proven robust and have achieved unusual success (PoE Report No. 5). Employment opportunities in the project for these vulnerable and poor Bote families provided them a chance to break trap of traditional debt bondage.

\(4\) 19.66 Ropani = 1 Hectare
As per provision in ACRP and the MMMP, KGEMU has involved the affected Bote families in the Project fish related works since the initiation of fish trapping and hauling program. Bote were selected form the affected families and given training on fisheries program in 1997. Fish Trapping and Hauling Program of the project is provisioned as a mitigation measure to the migratory fishes of Kali Gandaki River that will be impacted by the construction of the Dam. Altogether 8 members of the Bote community were employed in the fish trapping and hauling program during the project construction.

Altogether 36 Bote people from the local areas were employed in different jobs in the project. The main civil contractors IgL was the main employer with 16 Bote working for them followed by NEA with 12 and MKI with 1 Bote employees. The salary range was in between NRs, 2700.00 to 8,000.00 per month.

The overall percentage of employment among the people directly affected by displacement was much higher in Kali Gandaki “A” project than in any other comparable situation documented in the resettlement literature (PoE 2002). After completion the project, 17 Bote people are employed in different jobs in operation phase of the project that include 4 in NEA, 5 in fish hatchery, 3 in Cold water Fisheries Development office and 5 Bote people are engaged in boat operation.

7.3 Skill Training Program:

KGEMU conducted several skills training programs for the members of affected Bote families in order to assist them to reconstruct their livelihood. Similarly, the project contractors also included the Bote people in their various skill training programs. These programs help them to equip them with new skill required for project job.

10 Bote families were given training on aqua and cage culture program in Pokhara. Similarly 20 men and women of Bote community were given skill training on pig and poultry raising. The purpose of the training was to enhance their traditional skill and knowledge. Upon the completion of the training, affected Bote families of Andhimuhan village initiated pig and poultry raising program by forming micro group under the credit assistance from the project micro-credit revolving fund project. Similarly, training was provided them in different technicalities to equip them with skill.

7.4 Establishment of a Primary School for Bote Children

Social development plays a crucial role for long term rehabilitation of any community and is closely related with the enabling opportunities provided to them. Education plays vital role in enhancement of social development and capability required to grab the opportunities.

Most of the Bote are illiterate and Bote children refrained from going school. The schooling of Bote children had been very critical to them as the existing school was far from their village and existing social dominance of the children of rural elite in the school has also made them reluctant to send their children to the school. Bote children used to play and spend their most of the time in the river. The idea behind the establishment of a primary school for Bote children is to change the next generation of these affected families by providing access to education. Since, it is difficult to change the perception and mentality of the adults Bote people, it was expected that the access to education will change their children in due course of time.

Initially the school was established with four poles and thatched roof. Later on with the strong advocacy and support from Professor Michael M Cernea, the construction of school set in motion. NEA has acquired and provided 1.5 ropani of land for school, the main civil contractor, IgL, constructed three room school building. Similarly, the project contractor for Lot-5 contributed for required furniture for the school. Government has granted recognition for the school. Donation were given by the employees of project proponent, project consultant, project contractors, PoE, local community and the Bote themselves for deposition as per government rule to get approval form the government. The school is operating smoothly with grant support from district education office, Syangja for the salary of 3 teachers (1 male and 2 female) under Education for all Program.

This primary school has played vital role in the educational development of the Bote community especially
in Andhimuhan village of Shree Krishna Gandaki VDC. The maximum numbers of the students belonged to the Bote community. There are altogether 47 students in the school that includes 32 boys and 15 girls. The total number of students also includes 31 children from Bote family.

The establishment of a Primary School for Bote children near by their village is a remarkable example and an important gesture of project mitigation attempts for the sustainable resettlement of the affected indigenous Bote community.

An environmental service provider company, e-RG Nepal, (www.erg.com.np) under its Corporate Social Responsibilities Policy (CSR) has adopted the Bote school for two year to provide support for the enhancement of school. A two years contract is signed by the e-RG Nepal and the school management committee on August 10, 2006. As a token, educational materials and stationeries required for the School has been distributed by the e-RG Nepal on August 11, 2006 amidst a function at school.

7.5 Rural Electrification Program

Project-related rural electrification program is a good way for projects to gain local support and maintain good community relations. Affected comminutes understandably take the position that they should share in the principal benefit (electric power) of the project and not just the adverse impacts.

Initiated as integral part of the project in September 1997, the households benefited, so far, from this program are 4273 households in 11 VDCs of project areas. Similarly, the Bote houses are also connected with electricity. It has provided a remarkable benefit to local communities, affected families including these Bote families, in enhancing their quality of rural lives especially since electrification was initiated well in advance of project completion. Project-related rural electrification program is a good way for projects to gain local support and maintain good community relations.

7.6 Access to Fishing and Boating in Reservoir

Bote families heavily depend on the river for their livelihood and these resources were adversely impacted during project construction period. After the completion, the project, has created new opportunities in advanced form i.e. creation of boating transportation and fishing in the project reservoir. Local people operated the boating transportation in the reservoir up to the Setibeni holy site at a distance of 53 km. Some Bote have also put their share in the boating business and engaged in boat operation jobs. Besides, due to the fish stocking program regularly implemented by the project hatchery as part of fisheries mitigation program, the reservoir holds abundant fish. Bote people used to fishing through gill net in the reservoir that have supplemented their income. However, these vulnerable group of marginalized Bote people, whose livelihoods depend on traditional fishing and ferrying people across the river, should be given priority access on the reservoir for boating and fishing to ensure their sustainable livelihood.

7.7 Micro credit Revolving Fund Program

The Micro Credit Revolving Fund Program (MCRF) was implemented during the project construction period as a mitigation measures for project affected families (SPAFs/PAFs) including the Bote for their income restoration through income-generating activities. An amount of NRs, 29,00,000/- has been earmarked for the program. An amount of NRs, 60000.00 was released as credit to 4 group of 20 women from Bote families for income generating activities. One of the important achievements of the program can be attributed to the participation of women members of affected families in the income generating activities under this program. However, the program is not in operation after the completion of the project.

7.8 Community Development Initiation

The elders Bote including females got drunk by midday or early evening. They have the habit of spending the income on the same day they earn. But these traditional Bote communities are now more inclined towards community development activities. This can be attributed to the increased exposure, literacy and
income level gained by these Bote communities during project construction period. The Bote community has formed Kali Gandaki Fish Farming Committee and Andhimuhan Women Group in their community.

Kali Gandaki Fish Farming Committee
This fish farming committee was established on July 1, 2003 with the objective of income generation for local people through fishery and community saving as well. It was officially registered in Feb. 2006 in district administration office under the chairmanship of Prem Majhi. The committee comprises 31 members. The committee collects minimum NRs. 20.00 per month per member during general meeting as monthly saving and provides the loan in low interest for the members. According to Mr. Prem Majhi, the committee has a saving fund of NRs. 56928.00.

Andhimuhan Women's Group
A women's saving group was formed with the objective of community saving and women empowerment under the chairmanship of Miss Mina on 22nd July 2005 at Andhimuhan village. This saving group has 35 members who contribute a minimum of NRs. 20 every fortnight in general meeting. The group has nearly NRs. 8000 in saving fund, which is invested for the members with very low interest rate.

8 IMPACTS ASSESSMENT ON BOTE FAMILIES

Dam intervention have always been complicated because of lost of land, resettlement and compensation procedures and disruption in social and ecological condition of affected areas. Several impact studies have been carried out by KGEMU in order to monitoring the Project impacts among the vulnerable group of Bote families. Summary of the impacts is presented below;

The study undertaken in 1998 among Bote families of Andhimuhan, who were displaced by the access road and IgL’s, main civil contractor, workshop, brought forward the downtrodden situation of Bote families. The study indicated impact of loss of land leading to loss of trees, reduction in ownership of other assets, like animals, degrading fishing profession and loss of income. The study however found that some people started working in Project jobs but majority of Bote families was still seeking the jobs. The study had called for immediate attention to effective measures for their long-term rehabilitation (KGEMU 1998).

Following the recommendation of the previous study and the PoE report, KGEMU carried out an additional study in 1999. The study revealed some positive impacts this time like more Bote being employed in Project jobs and subsequent income in their cash income, implementation of some educational and income generation program (e.g. poultry, piggery etc.) by Project. But the study also signaled some adverse impacts too. Some families were moved to risky areas i.e. below or on the inundation level of reservoir.

The post-construction environmental impact audit study found that the Project "...has had mixed impact (both beneficial and adverse) on the traditional livelihoods and lifestyles of the Bote community..." The Bote people depend on traditional fishing, ferrying people across the river in small boats, and working as wage laborers for their livelihoods. Though they were adversely affected by the expropriation of the land and houses and loss of their traditional occupation of fishing and boating during the project construction, the Project also created new opportunities for boating on the reservoir up to Setibeni holy site, fishing in reservoir and long-term employment opportunities in the project fish hatchery.

In summary, these studies indicated that Bote families of Andhimuhan were affected mainly by the acquisition of land and expropriation of houses. The Bote families residing upstream and downstream of the Project are not directly affected by land take and house expropriation. The findings of these studies also present positive trends which have been helpful in enhancement of socio-economic status of these affected Bote families. For example; proper compensation for acquired assets, project employment during construction, skill training program on various area including fisheries, employment of the affected Bote families in the Project fisheries program and the construction works and in operation phase have resulted significant increment in their cash income, implementation of adult literacy program have enhanced their morale and ego as being able to read and write, skill training program on pig and poultry raising have enhanced their traditional knowledge to adopt new techniques, construction of pig shed for pig raising and delivery of micro-credit for income generating activities. Project also created new opportunities for boating
on the reservoir up to Setiben holy site, fishing in the project reservoir and long-term employment
opportunities in the project fish hatchery and in Kali Gandaki Project during the operation phase of the
project.

In the case of Kali Gandaki "A" Project, the main affected families did not become worse off because of
two reasons. First, the provision of higher compensation rate in comparison to earlier instances in Nepal.
Second, they made up the loss through employment during the project construction period or through other
economic opportunities (Rai, Kavita 2005).

9 CONCLUSION

Most of the proposed requirements set forth in the various project’s documents for mitigating the adverse
environmental impacts due to project construction have been implemented. The beneficial impact of the
project due to the access road, rural electrification in infrastructure development, education promotion and
employment have made local transformation.

A considerable amount of cash flow to the local Bote community during project construction ensures at
least previous living standard of SPAFs/PAFs. The mitigation measures implemented by the project for the
affected Bote families have transformed their socio-economic status. They have now better house in
comparison to their previous one. Employment opportunities in the project during construction and long
term employment in the projects fish hatchery in operation phase has provided sustainable livelihood for
the Bote families and helped them to come out of their traditional debt bandage.

The Kali Gandaki "A" Hydroelectric Project is not only the largest project implemented so far in Nepal, it
has lead the way in the field of environmental monitoring and management as well as the studies
undertaken. Kali Gandaki "A" HEP is the first project in Nepal to undertake EIA study, a full staff
environmental unit (KGEMU) during construction, post-construction environmental impact audit study,
operation phase environmental monitoring and mitigation and preparation of comprehensive environmental
and social operation manual.

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