EVALUATING IMPACTS OF GHAZI BAROTHA HYDROPOWER PROJECT ON RE-SETTLERS AT BAROTHA MODEL VILLAGE, ATTOCK, PAKISTAN

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Abstract: This study is aimed to evaluate the long term impacts of Ghazi Barotha Hydropower Project (GBHP) on the lives of the Project Affected Peoples (PAPs), since their dislocation in 1995. Field surveys, focused group discussions, field observations were used for the collection of primary data, while secondary data was collected from project’s documents, past review studies of the project, reports of the donor agencies, and government’s policy guideline about resettlement. Results of the study show that the socio economic effects of the GBHP were not accurately predicted during project planning and measures to rehabilitate PAPs of GHBP were not effective enough. Amongst major areas, which were left unaddressed during project planning and operation include alternative livelihood means in situation when major earning sources of agriculture and livestock totally collapsed due to GBHP. The socio economic effects together with other human use and quality of life values have caused sense of disappointment amongst the re-settlers. Suggestions have been provided to mitigate the key issues of the project hence making it an example of sustainable development in the local as well as national context.

Key Words: Project affected people, resettlement, livelihood

Introduction

Pakistan has been passing through an extraordinary energy crisis for about half a decade and is becoming intolerable now. Lopsided priorities, poor management and lack of accountability can be denoted as the reasons for shortage of energy in Pakistan (Iqbal, 2012). This demand is not only increasing in domestic sector but also commercial and industrial sectors. These crises have started affecting the country’s economy fatally. In the prevailing situation, it is not only hard to bring in foreign investors, but even the local industrialists have started moving their units to other favorable countries in Asia. Asia is becoming very competitive, with neighboring countries like China, Bangladesh and India providing every possible incentive to the foreign investors. In such situation Pakistan has to put every
sincere effort to make way ahead of the competition.

The hydropower potential in Pakistan is over 100,000 MW with identified sites of 55,000 (GoP, 2009). GBHP was a multi donor funded project with major donors included; the World Bank (WB), Asian Development Bank (ADB), Japanese Bank for International Cooperation, Kreditanstalt fuer Wiederaufbau (KfW), European Investment Bank, and Islamic Development Bank, besides, WAPDA (WAPDA, 2010-11). The project was completed in 10 years costing US $2.2 billion (ADB, 2005).

The Project caused affecting human and natural environment since its initiation in 1995. WAPDA developed a “Resettlement Action Plan (RAP)” (GBHP, 1994) under the then draft National Resettlement Policy (GoP, 2002) to minimize the untoward effects of the project. This also included development of a model village “Barotha Model Village (BMV)” for the directPAPs i.e. displaced peoples, who were resettled near the site of power complex of the GBHP (GBHP, 1994). This village was supposed to be a model one that would provide all basic facilities to the PAPs including health care, education, and drinking water besides their other compensations.

Statistics available at the completion of eight-year of GBHP reveals that the project contributed about 53 billion units (53 billion kWh) of electricity to the national grid, registering revenues of Rs. 226.5 billion to the national exchequer (Daily Times, 2011).

Study Objectives

Objectives of the current study include the following:

- To evaluate the long term impacts of GBHP on the lives of displaced community including agricultural, livestock, housing, environment, communication, aesthetics and others.

- To post audit the implementation of the Resettlement Action Plan (RAP), already approved under the provisions of the World Bank Operational Directive and the then draft National Resettlement Policy.

- To use the new findings as recommendations for planning hydropower projects of similar nature in future.

The paper is divided into 4 sections. This introduction is followed by the section on an overview of GBHP and the background literature. Materials and methods used for the collection of data are described in section 3, while Section 4 provides main results and conclusion of the study.

Overview of GBHP and background literature overview of GBHP

The work on GBHP was started in 1995. The project diverts water from the Indus River at Ghazi (few kilometers (Km) downstream of Tarbela dam) to a 52 km power channel. This channel transports water to a power complex with an installed capacity of 1450 megawatt (MW) at Barotha, Attock. The detailed layout of the project is provided in Figure 1. GBHP is a run-of-the-river project; with least
environmental and social impacts. It consists of three major components including a barrage at Ghazi, a 52 km channel from Ghazi to Barotha and a power complex at Barotha (ADB, 2005).

Generation of hydropower to support the increasing demand of electricity in Pakistan through approach that is environment friendly and socially feasible (with least environmental and resettlement impacts) was the main objective of the GBHP. This would also neutralize the higher cost of thermal power generation (ADB, 2005; Pakistan Hydro Consultant, 1994).

**Literature Review**

World Commission on Dams was established in April, 1997 in Switzerland in a workshop supported by IUCN-World Bank for the stern impacts of large reservoirs. The Commission started working in May 1998 and assessed around 1000 dams with varying degrees of intensity and a comprehensive global survey of 125 dams all over the world (WCD, 2000). Some 1.7 billion of these people live in "highly stressed" water basins where problems with local food production and economic development abound (Revenga, et al: 2000), especially the acute pressure on fresh-water resources in the arid regions that provide irrigation facility for expanding agricultural practices (Mygatt 2006). Nearly 70 percent of global water withdrawals from rivers, lakes, and aquifers are used for irrigation, while the industry and households account for 20 and 10 percent, respectively.

The WCD (2000, p. 35) also acknowledges the benefits of large dams in the following words, “Dams have made an important and significant contribution to human development, and the benefits derived from them have been considerable”. Hydropower, thus meets the basic requirements necessary for economic and social development. In countries, where a vast amount of development still lies ahead, opportunities often existing for renewable energy sources should be exploited. The technically most advanced and economical source of renewable energy is hydropower (ICOLD, 1999).

The environmental impacts associated with reservoirs / dams projects vary from project to project and depend mainly on the site of the project rather than its size. The environmental impacts are also dependent on resources present at the site. Based on the site, the impacts can usually be observed on; (1) Physical Resources, (2) Ecological Resources, (3) Human Use Values and (4) Quality of Life Values (Ali, 1993). Derban (1984) has evaluated the impacts arising due to resettlement, alteration in the ecosystem and different water born diseases in Ghana.

Tariq (1993) in a study on the environmental impacts of Tarbela Dam in Pakistan has identified the major beneficial impacts of power generation, irrigation provisions, flood control and ground water recharge along the periphery of the reservoir and downstream where previously the water table was too low. As a result of the recharge factor, those areas once lying barren have gotten its ground water recharged and the lands have become lush green and productive. However, due to recharging of the ground water, the project also caused the associated problems of water logging and salinity in the closer
vicinity. These are mainly the areas that are devoid of adequate drainage system. The project, by dislocating about 96,000 persons caused the greatest human resettlement issue. Whereas the minor environmental impacts discussed are effects on wildlife, navigation, climate, forests and fisheries.

Policy considerations given in the objective of the World Bank operational directive regarding involuntary resettlement says that re-settlers should be provided with sufficient investment resources and opportunities to share in project benefits besides compensation for their losses and assistance in their efforts to improve their former living standards, and income earning capacity. To ensure the economic and social viability of the relocated communities, adequate resources should be allocated to provide shelter, infrastructure (e.g., water supply, feeder roads), and social services (e.g., schools, health care centers).

The resettlement plan should, where feasible, exploit new economic activities made possible by the main investment requiring the displacement. Vocational training, employment counseling, transportation to jobs, employment in the main investment project or in resettlement activities, establishment of industries, incentives for firms to locate in the area, credit and extension for small businesses or reservoir aquaculture, and preference in public sector employment should all be considered where appropriate. (World Bank, 1990)

Sections 6-10 of Land Acquisition Act, 1894 relating to acquisition, valuation, entitlements and compensation are inconsistent to meet resettlement principles and requirements of foreign donors and international agencies, emphasizing on community involvement and consultation, taking into account adverse socio-cultural losses; and rehabilitation of vulnerable affected groups (punjablaws website). To ensure compliance with resettlement principles, the mechanism for making valuation and applying various measures to ensure its fairness, a Project Non-Governmental Organization (PNGO) called Ghazi Barotha Taraqiati Idara (GBTI) was established. However, the principle of compensating the PAPs at replacement cost, and rehabilitation of the lost incomes and livelihoods up to the pre-project level was not achieved.

Major activity in rehabilitation is the income restoration program, aiming to develop certain measures for those PAPs, who are disadvantaged in terms of income generation and employment. Long term strategies will aim to enable and improve the PAPs standards of living. Both the land-based and non-land-based economic activities will be generated to provide a sustained source of income over a longer time-period. These would include: (i) project-sponsored programs like regular employment, training and providing various inputs for income raising (ii) subsidized inputs for agricultural and livestock production arranged by the proponents, for the first two or three years, or until the desired income level are restored (iii) establishing linkages to the national socio-economic uplift and employment generation programs in the project area and (iv) initiatives by the NGOs and DFIs like rural credit or micro-enterprises etc. (GoP, 2002).

Model villages including the under discussion Barotha Model Village supposedly having all basic facilities (water
supply, sewerage, electricity, school, dispensary, *paccia* i.e. metalled roads, playground for children, mosque, graveyard, community center and approach road) were developed and all PAPs were resettled there. However, studies carried out on the assessment of social impacts on these dislocated communities show large gap between the promises and the actual situation on the ground. The communities / households are dissatisfied with the project’s services and infrastructure provided to them in the model villages (Anwar et al, 2006).

![Fig. 1: Detailed layout of GBHP](image)

*Source: Pakistan Hydro Consultants (1994)*

**Materials and Methods**

Both the primary as well as secondary data were collected to meet the study objectives. For primary data collection two separate teams (male and female) were formed. A technical representative of the Ghazi Barotha Taraqiati Idara (GBTI) guided and facilitated the teams in the field. The following participatory assessment techniques were adopted for collection of information:

- Questionnaire Survey
- Focus Group Discussions
- Participants Observation
- General Observation
- Reflective Probing

On field, briefing by the GBTI technical representative was provided during the GBHP visit at different sites. The information collected was consolidated for further analysis.

Secondary data required for the study purpose was obtained from technical reviews and project’s completion reports of concerned donor agencies.
Results and Discussion

Based on the data collected in the study, following are the major impacts of GBHP on physical and human environment in the study area.

Agriculture Sector

The PAPs mostly associated with agriculture were cultivating their own agriculture land. Most of the families had huge land holding (Figure 2) and had high grain yields. This high grain yield not only fed the entire family for a complete year but was also a major source of income (as they were able to sell access grain in the local market). Besides farming, families were also able to meet their fuel wood demand from agroforestry i.e. trees planted around their fields.

Income restoration is an important element in the draft National Resettlement Policy, of 2002 (GoP, 2002). The field research reflects that very little attention was paid to this area. Agriculture was the major sector among the previous livelihood opportunities supporting the local population for subsistence. It was one hard hit sector in the project area. According to the project documents 97% of the land acquired by the project was cultivable. After the project, there have been no apparent efforts of providing alternative livelihood opportunities. The remaining agriculture land is in bits and pieces and its productivity is not as much as it was before (mainly due to the absence of affordable irrigation source).

Livestock

The livestock was a second larger livelihood source after agriculture and farming in the area and went parallel with agricultural activities. Before the start of GBHP, the average livestock per house hold was 11. The livestock holding met a family’s dairy products and meat demands, it was also a source of income. Because livestock rearing was a parallel activity of a farming family, when the land holding decreased it ultimately impacted their livestock holding, bringing the number down to an average of only 2 livestock per house hold (Fig. 3). This decrease in livestock has had some direct and indirect unwanted effects on PAPs e.g. Food intake now has less dietary values, which impacted the health of PAPs.

Housing and Living Conditions

Our results indicate that there has been an improvement in the overall housing conditions with the implementation of the project.

86% of the total respondents were living in muddy (kacha) houses before the GBHP, and now almost the same percentage (i.e. 86%) of the total respondents are living in concrete (cemented) houses, while 7% each lived in mixed/muddy type of houses before and after the project (Fig. 4).
Evaluating Impacts of Ghazi Barotha Hydropower Project on Re-Settlers at Barotha Model Village, Attock, Pakistan

Street Condition and Drainage system

The project also contributed to the construction of streets and sanitary drains in the model villages, which were previously either lacking or in poor condition. One drawback though (in this construction) was that the level of constructed drains is higher than the ground level and proper culverts are not constructed. Hence the community often complains about it, as these drains are less beneficial and more problematic.

Security and Safety

People are now more concerned about their security than they were before. According to them the security situation has deteriorated after GBHP as people from different areas resettled here for
employment in the GBHP and are unknown to the locals. While before the project, everybody lived in a strong social cohesion did not allow anybody from outside to come and commit robbery causing any lose or damages to the local community. But now, they are a little skeptical about their next door neighbors.

**Electricity Conditions**

Although, it was promised that the PAPs will get free electricity from GBHP, however, the promise never materialized. Policy considerations given in the objective of the World Bank operational directive regarding involuntary resettlement also says that “re-settlers should be provided with sufficient investment resources and opportunities to share in project benefits besides compensation for their losses and assistance in their efforts to improve their former living standards”. Actual situation of electricity is not different from other parts of the country. The project has less effect on the electricity status improvement in the area. The increased load shedding and hiked prices of electricity has increased economic burden on the local community.

**Social Services and Facilities Education**

As promised, two middle schools (one for boys and one for girls) were constructed in the model village. These schools are probably the only social service they get in right status. The local community seems satisfied with the education system here. However, it was repeatedly highlighted that girls after finishing middle school quit schooling due to lack of high school or college (these facilities are only available in the nearby Attock city and sending girls to that is not possible in current socio economic situation).

**Health**

Before the GBHP, the local community had to move to Attock city for getting medication. After the GBHP, the problem remains the same. It was promised that the new village will be a model one and along with other social services, a dispensary will be developed for quicker relief in illness; hence a dispensary building was constructed. However, it never operationalized and now after many years the building is damaged and the funny thing is that the building is used for keeping livestock by the local people.

**Water Supply**

In the GBHP, the PAPs were promised for water supply schemes as well. It was constructed but now it is abandoned due to repair and maintenance. Now people have dig out their own wells and bores in their houses on their own expenses. Like the dispensary, the water scheme is also abandoned and the building is getting eroded day by day.

**Recreation and Aesthetics**

A playground / park was part of the initial plan of Barotha Model Village. The land was demarcated for that purpose. But the specified land was not properly developed as park or playground. Later on that land was used for the construction of the dispensary, water scheme, schools and mosque buildings. Due to these constructions, the remainder of the land was not sufficient for establishment of a public park. This remaining open space is not
properly maintained. The drainage channels near the ground are clogged due to poor maintenance and stagnant water is a source of mosquitoes and bad smell in the surrounding environment. So the space is serving the reverse of recreation (i.e. nuisance) to the local community.

![Fig. 4: Housing type (before and after GBHP)](image)

**Communication**

The road that connects the Barotha Model Village to Attock city is very narrow and now damaged at various locations. In public transport, small vehicles usually move between BMV and Attock city, but are less frequent (due to poor road condition) and very uncomfortable. This is the major route that is used for movement to the city for access to health services, social interactions, schooling and market.

**Gap between Compensation Packages Promised and Implementation Promises**

According to the local community, at the start of the project, they were promised of various incentives including; market based compensation (value) for their lands, employment in the GBHP, free electricity, and the model village with all the basic necessities (including health services through construction of civil dispensary, education through two middle schools for boys and girls, clean drinking water through water supply scheme, play ground for children, water for agriculture land and space for grave yard and funeral place). Unfortunately, most of the promises were not fulfilled, or filled partially. Although they were compensated for the land acquired from them for the project, they were not provided with water for irrigating their agricultural fields. They were provided with schools but the dispensary was never operational. The water supply scheme was erected but now abandoned and people are compelled to drill bores or dig wells in their homes with their own expenses.

The project is all about the electricity generation. The PAPs before the project were promised that they will get free electricity, but that never happened. In fact, the situation is getting worse day by day like other parts of the country. The most important aspect highlighted was the provision of alternative livelihood.
opportunities. As PAPs were mostly relying on agriculture and livestock for subsistence, the huge amount of land conversion (from agriculture to the electric project development) directly affected their livelihood. Even the very little remaining agriculture land with the PAPs is not productive due to unavailability of water. The electric generator based irrigation is costly alternative and is not worth it. The PAPs are extremely un-satisfied with the consequences of the project. They state that, “the project is beneficial for the country but not for us. It has caused a lot of unfavorable impacts on our lives.”

Conclusions

The generation of electricity, especially hydroelectricity is need of the time particularly in Pakistan. The analysis establishes that assessment of the project for its post implementation impacts over the lives of PAPs particularly income generation was not accurately carried out. Community at Barotha Model Village expressed displeasure at the project authorities for many reasons discussed above.

The project is obviously very significant for the country in the prevailing energy crises situation, however, it is also very vital to give immediate attention to the issues highlighted in this study and take actions in light of the suggestions given in the proceeding section.

Suggestions

I. Although, income restoration is an important element in the WB operational directives for involuntary resettlement and GoP’s draft National Resettlement Policy. The field research reflects that very little attention was given to provision of alternative livelihood. The previous livelihood opportunities including agriculture and livestock were severely damaged with the project. The PAPs were also not provided with job opportunities in the project. It is of utmost importance to re-assess in detail the employment situation of the affectees and develop a comprehensive program for provision of sustainable alternative livelihood opportunities. This seems primary responsibility of the WAPDA and governing office of GBHP. Funding may be sorted out with old donors / new or from the income generated by GBHP.

II. Agriculture was the main source of livelihood for PAPs. As most of the agriculture land was acquired for the project, PAPs were left with little land to do economical farming after the GBHP. To use this small land holdings for productive agriculture, irrigation water is crucial, which can be provided with very low cost by sucking water from the seepage water from the project pond and pooled into a tank / small reservoir and distributed to fields through irrigation channels. This would help improve the productivity directly from the land, and also help feeding livestock for subsistence. The waste water coming out of seepage from the project’s pond will be utilized economically in this manner.

III. The dispensary if operationalized would help reduce the health cost on the PAPs as they have to go far to Attock city for smaller health issues. A local doctor or dispenser (if doctor
is not available) would be a more sustainable option.

IV. The water supply scheme can be functionalized with little efforts and very little repair and maintenance cost. This needs to be re-operationalized on priority basis to resolve the issue of water supply in the village.

V. The broken / unclean drainage channels around the playground becoming a source of stagnant wastewater in the small land meant for playground are also source of spreading diseases. These need to be repaired and cleaned to provide hygienic conditions as well as to enable children utilize the remaining land of playground for games and recreational activities.

VI. Effects of the project intervention on the livelihood of PAPs must be carefully assessed before the execution of development projects in future and a comprehensive program should be incorporated in the project plan comprising of provision of alternative livelihood to the affected families. There should be regular monitoring after project implementation to ensure compliance with project’s plan for the PAPs and environmental safeguard. The monitoring team must include representative of affected community, project personnel and concerned Environmental Protection Agency.

References


Tariq, M., 1993. Environmental Impacts of Tarbela Dam Project, WAPDA.


Online search