

Impact of Raising Mangla Hydropower Dam on Rural Land and Crop Production Pattern

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Abstract

Dam induced displacements causes several damages to the life of inhabitants in different areas of the world. Many people lose the ability of returning towards their lives. It is necessary to establish mandatory policies for the dam induced affected people. This study presents the consequences of raising Mangla Dam, mainly the after effects on land and crop production pattern. In order to attain the required information, different approaches were employed like questionnaire, in-depth interviews, focused group discussions and direct and indirect observations. After going through analysis of the conducted field work and collected data, the obtained results indicate that around 803 acres of residential land, 4,358 acres of agricultural land, and 4,299 acres of barren land was affected due to this project. The crop production also decreased due to the land becoming less fertile and the people started preferring to grow different kinds of vegetables more than the congenital crops like millet, wheat and maize.

Keywords Resettlement- Mangla Dam- Dam Induced Displacement- Raising of Dam- Rural livelihoods- Population- River Jhelum- Pakistan

1. INTRODUCTION:

Pakistan has vast resources of water. A huge belt of mountainous region is found in north east of Pakistan. The two main rivers of Pakistan are the Indus and the Jhelum. These two rivers forms a huge network of irrigation system to fulfill the water requirement for drinking purpose and crop production. In order to accomplish the demand of water in low flow season, storage structures are required. Mangla and Tarbela are the two main multipurpose dams in Pakistan. With the passage of time these water storage structures reduced their capacity to store water due to the huge amount of silt deposited. Hence the construction of new dam or raising of existing dam is required to increase the volume of storage structure in order to attain the maximum amount of water. When raising of the dam takes place, more land is acquired around the existing dam. In this way, the people of nearby area gets affected and they forced to displace from their land to another place which is called dam induced displacement. This matter is of great humanitarian concern which displace thousands of people, directly affects their houses, agricultural land and sources of income etc.

Mangla dam was completed in 1967 having storage capacity of 5.2 MAF. In 2004, the raising project was started to prevail over the required amount of water for irrigation and energy to generate electricity.(A. Ahmed, 2007). The central source of depletion in storage is the deposition of sediments in dam which reduced 80% of its storage capacity estimated in 2005 by using hydrographical survey (Abbas, 2007).Therefore it is mandatory to built new storage structure or raise the existing dam. Due to fast development in dam sector, many impulsive displacements takes place in present era. It was estimated that around 39.5 to 79.5 million people move from one place to another (Icold Ahead, 2013). The same case study is presented here regarding the resettlement aspects of dam raising.

Resettlement due to construction of dams displaced millions of people around the world. It was estimated by World Bank that 10 million people were displaced due to these kind of development projects in last decade of 19th century (Cernea, 1997). Dam induced displacement contributes in the displacement to the largest number of people (approximately 40%) as compared to other infrastructural development projects. Several studies (Cernea, 2003) shows that DIDR negatively affect on the living values of the displaced communities. Many people loss their valuable assets, move towards economic poverty, their social and cultural ethics and may never be able to return towards their lives(Maldonado, 2012). In Dam induced displacement and resettlement only few projects had positive outcomes for the peoples (Ty, 2015).Dam induced displacement may provide a positive way to move forward by providing better facilities and compensations of the loss of the affected people.

The results of this study have several implications for theorist and practitioners. This research has found results which support the need for improvement in the planning, design and execution of resettlement policies. Elements such as active participation in decision-making should be underlined in future policy reformation.

2. Study Area

Jhelum river is the second largest river in Pakistan. Mangla watershed region lies at 73°3' to 75°35' E and 32°59' to 35°10' N. It consist of mountainous region having snow cover, agricultural lands, barren land, grassy lands and forests. The storage capacity of Mangla dam reduced to only 5764.31 million cubic meter at the time of raising(M. J. Butt, 2011).

The tributaries of Jhelum river such as Poonch, Neelum and Kunhar plays a vital role to draw silt in various pockets of Mangla dam. Water and Power Development

Authority collects the flow data at Upper Jhelum, Lower Jhelum, Jari, Main and Kanshi. Administrative authority of Pakistan for dam displacements proposed a plan using the State Resettlement Policy 2000 in collaboration with International Finance Corporation. Resettlement Action Plan of Mangla consisted of five sectors of Azad Kashmir, New Mirpur city and four towns i.e. Islamgarh, Chaksawri, Punjab and Dudial. These five sectors are presented in Figure 1.

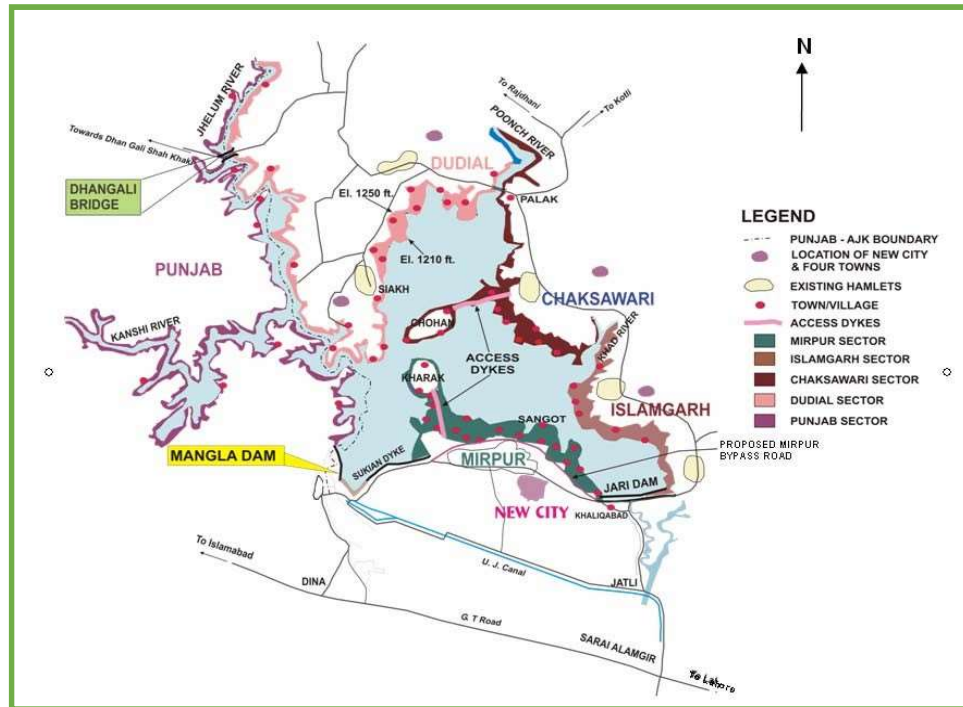


Figure1: Sector-wise Location of Affected Area (Chaudry, 2007)

3. Methodology

This study is based on questionnaire and oral opinions of the people of the five sectors of Mirpur Azad Kashmir settled in new cities and towns after resettlement program of Mangla dam raising. Complementary approach is used by combining all methods in order to obtain precise results. Preliminary survey of villages was conducted to visualize the location. A total of 100 households were questioned in detail by using questionnaire, in which 30 households were located in Mirpur and 70 of them were questioned in small villages of Islamgarh, Dudial, Chaksawri and Punjab. The questionnaire focused on the surroundings of the displaced people such as community characteristics before and after resettlement. Information is also collected through interviews to understand the feelings and insight thoughts of the project affected persons. Interviews were also held with the community leaders, government officials and the concerning hydropower development authorities to gain in-depth knowledge on the implemented resettlement plan. Last but not the least statistics papers and reports on resettlement action plan were collected from the consultants and contractors of the project.

The collected data was analysed in connection with objectives of the study and the resulting analysis is presented in forms of charts and tables in the following section.

4. Results and Discussions

The study of factors involved in the process of resettlement greatly contributes for reader to understand the planning and execution of mega structures causing mass displacement of people. The process of resettlement has different phases in which every person of Mirpur, Islamgarh, Dudial, Punjab and Chaksawri was directly or indirectly involved. The information from the verbal sources of the resettled area, the village leaders, the community and the experience of the local people helps to understand the development and implementation of the whole resettlement process. In this study only impact on land and the crop production pattern before and after resettlement has been discussed.

4.1 Impact on Land

On the basis of field survey and other parameters such as interviews from concerned authorities, local people, government officials and historical records, it was estimated that more than 9,000 acres of the land was affected on the periphery of the dam out of which 4,299 acres of barren land is also included. The most affected land was residential and agricultural land (Chaksawri and Dudial) having area of 803 acres and 4,358 acres, respectively (Table 1). The graphical presentation of type of land affected in different sectors is shown in Figure 2.

Table 1: Raising Impact on Land (Source: Fieldwork Mangla, 2017)

Sector	Mirpur	Islamgarh	Chaksawri	Dudial	Punjab	Total Area (Acres)
Residential Land (Acres)	240	149	242	153	19	803
Agricultural Land (Acres)	860	617	1151	1354	376	4358
Barren Land (Acres)	2173	1533	1418	2173	2955	4299

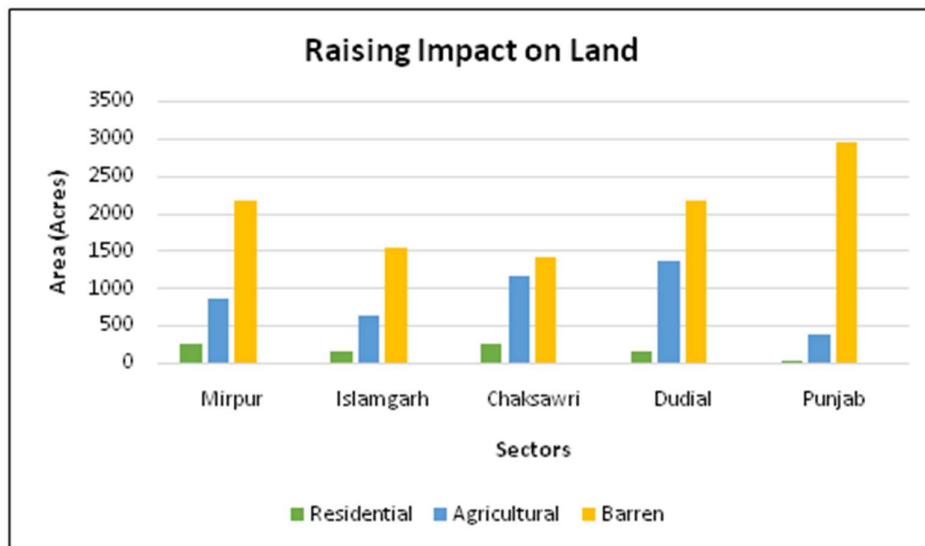


Figure 2: Type of land affected in different sectors

4.2 Impact on Crop Production Pattern

On the basis of field survey and other parameters, analysis shows that the people of affected areas cultivated millet, fruits, wheat and various types of vegetables on large tracts of productive land to meet their need of food and nutrients. 54% of the villagers of each sector responded that their food requirement from the previous land satisfied their needs. After resettlement, they responded that the existing land doesn't fulfil their food requirements due to infertility and other multiple changes in resettled area. In order to generate income and sustain their family expenses, the people sold their own part of food production which they used at their homes.

The households of these villages grew different type of crops like wheat, pulses, millet, maize, rice and vegetables out of which 28% of villagers grew wheat and 12% maize before resettlement. This production reduced to 23% for wheat and 6% maize after resettlement. Only the increase in production of vegetables from 11% to 20% was estimated after resettlement (Table 2). This indicates that the sources of income from crop production decreased after resettlement and also the change in crop production pattern. This change in crop production pattern is graphically presented in Figure 3.

Table 2: Production of crops before & after Resettlement

Crops	Respondents in % who grew crops Before Resettlement	Respondents in % who grew crops After Resettlement
Wheat	28	23
Maize	12	6
Millet (Bajra)	15	7
Pulses (Beans)	26	18
Rice	8	2
Vegetables	11	20

A major shift towards increased interest in growing vegetables after resettlement was observed in the cropping pattern.

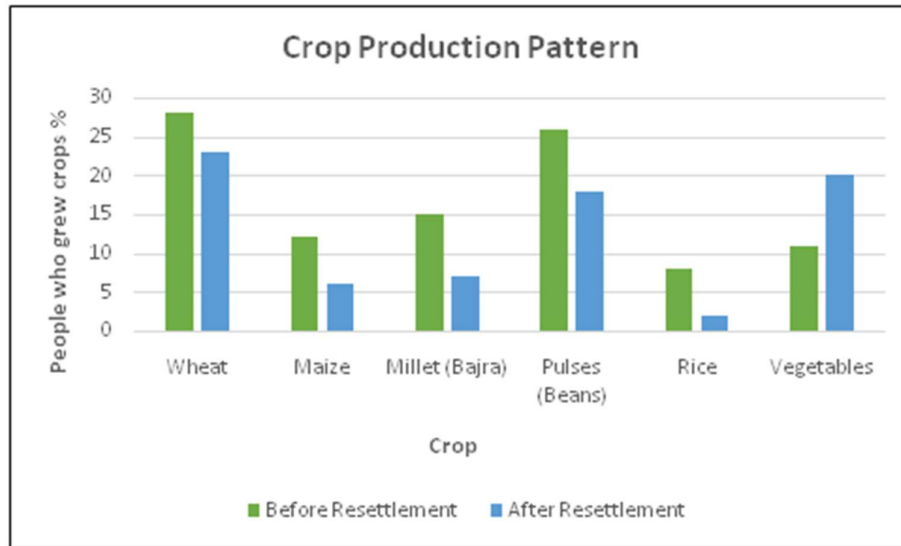


Figure3: Crop production pattern before and after resettlement

The above presented analysis of the results reveals that the raising of Mangla Dam significantly affected the life of people residing in the area. A large number of population had to leave their native towns and move to new places. The process not only changed the cropping policy but also affected the land use pattern in the area. Since agriculture had been the major source of income for the residents, this change also had impact on social structure and other life factors of the displaced people. Future studies are encouraged to analyse the impact of the raising process on these social factors.

5. Conclusions

In this study, two main social aspects of the resettlement program of Mangla dam raising has been analysed. On the basis of the results obtained from the conducted study, following conclusions can be drawn:

- 9000 acres of land was affected including residential, agricultural and barren land.
- Due to the change in crop production pattern the sources of income was also affected. As the soil was not so fertile as compared to the previous one, the crop production decreased and the people started to grow different kinds of vegetables more than millet, wheat and maize.

6. Recommendations

This type of dam induced displacements badly affects the living ways of the inhabitants of these small areas due to the negligence and mismanagement of such kind of resettlement policies. There is a need of time to improve the planning, designing and implementation of these policies according to the "National Resettlement Policy of Pakistan 2000". Similarly active participation of local leaders in decision making can play a vital role for the improvement in these policies. Future research may focus on the application of adaptation of new strategies for the resettled communities. The available resources like Government authorities and NGO's must be used pro actively to protect people from poverty by helping them in some way or the other. Training must be

provided to the people on former resettlements and experiences must be shared to create successful adaptation and to save people from impoverishment.

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