

The Socioeconomic Impact of Mirani Dam in District Kech, Balochistan, Pakistan

Nazir Ahmed¹, Ambreen Zeb Khaskhelly², Habibullah Magsi³ Rafique Ahmed Chandio

¹Agriculture on Farm Water Management Department, District Kech, Balochistan, Pakistan.

²Department of Economics, University of Sindh, Jamshoro, Pakistan.

³Department of Agricultural Economics, Sindh Agriculture University, Tandojam, Pakistan

*Email: meerannazir@gmail.com

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Abstract: The purpose of the study was to know the socioeconomic characteristics of sampled households before and after the construction of Mirani dam right and left bank canal, which were completed in 2006. The distribution of irrigation water was initiated in 2008 for the cultivation of land. Due to construction of dam, production of all major crops has increased significantly. A representative sample of 8 distributaries and 371 farm households (211 from RBC and 160 from LBC) were selected for collecting primary information from the field. According to respondents after construction of both canals their income level, consumption expenditure, and saving increased. The result of this study revealed that the economic status of the sampled household changes after Mirani dam right and left bank canal. With the increase of income now they are sending more children in school than before. The average number of goats before Mirani Dam Right and Left Bank Canal were 5.96 TLU with standard error 0.54 and after it, increased to 24.94 with standard error 1.85. The average number of camels before Mirani dam right and left bank canal was 0.11, Sheep 0.06, Cow 0.20 and the Donkey 0.09 respectively. Whereas the average number of the camel increased to 0.32, Sheep 1.27, Cow 0.20, and Donkey 0.56 respectively. Overall after construction of the dam the production of crops, number of livestock, dead stocks, income level, expenditure, savings, number of pucca houses and number of schools going children increased significantly because socioeconomic condition of the people in the study area considerably improved.

Keywords: Mirani dam, socioeconomic importance, right and left bank canal.

Introduction

Globally dams are developed to increase irrigation, electricity generation and flood control, but they had negative consequences like displacement (Sun, 2013; Williams and Portter, 2006), and water logging, especially in developing countries (World Commission on Dams, 2000a). The supporters of the dams argue that while these reimbursements may be enjoyed by downstream inhabitants, while, upstream inhabitants benefit only from the construction activity and potentially, from increased economic activity around the reservoir (McCully, 2001; Singh 2002). Although, the infrastructural development projects like dams have great importance. But most of the infrastructure become a cause of disagreement like land use conflicts between either local population for different uses or between governments or local population due to mismanagement (Chakravorty, 2016).

The water resource management resources development and management are very important for sustainable farming in the water deficient region. In Punjab Pakistan, 32 small dams, were built in the Pothwar region to store and preserve water for agricultural purpose. These dams increased the land use, crop intensities, crop yield and shifted the cropping pattern from conventional cropping towards high valued crops. The construction of dams has also increased the water table and makes water available for

irrigation (Ashraf et al., 2007). The construction of dams increased the crop revenue by improving the yield of all crops. (Wajid et al, 2013). Dams have proved useful in improving the socioeconomic condition of the farmers. In the area there is a huge opportunity and need to build additional dams to conserve rain water (Khan et al, 2011).

Balochistan is the largest province of Pakistan. The total geographical area of the province is 347190 km² covering 44% of the country's total land area (GOB, 2010). The province is located far from the Indus river and facing severe shortage of water as compared to the other provinces of Pakistan (Bengali, 2009). The main source of water is rainfall, Karezes and tube wells, during last two decades show a descending trend (Shah et al, 2002) due to less rainfall in the province. Surface and ground water level is decreasing gradually (GOB, 2010). Due to the serious situation farmers should be given awareness to save trees and to cultivate crops in such water scarcity situation. Shortage of water is the main cause of the reduced agricultural productivity. The basic purpose of the dam is to store water during wet periods and provide water in dry periods (World commission on dam, 2000). It also helps to recharge the ground water nearby open surface wells especially in Balochistan. The Mirani dam was selected for this study, which is located on Dasht River, approximately 40 km west of Turbat in Mekran division of Balochistan. The objective of this dam was to bring

more land under cultivation in the region, while collecting flood water from rivers and irrigate 33,200 acres barani land. It was constructed under WAPDA's vision 2025 Water and Power Development Program. Its total catchment area is 7964 km² and gross storage capacities are 302000 acre- feet and maximum height is 127ft (WAPDA, 2007).

Agricultural development is one of the most important

socioeconomic variable and capital assets before and after Mirani dam construction, Pearson correlation test was applied.

Results and Discussion

This section is divided into two parts. The first part explains the characteristics of the interviewed farm families and the second part presents the capital assets

Table 1 Respondents descriptive analysis.

Particulars	Description	
	Before Right & Left Bank Canal (2008)	After Right & Left Bank Canal (2016-17)
Age (Years)	38.47	47.47
Standard error	±0.69	±0.69
Household Size (Number)	5.43	6.23
Standard error	±0.15	±0.15
Education (Years)	-----	6.23
Standard error	-----	±0.35
School going children (Number)	0.81	1-88
Standard error	±0.06	±0.08
Family system	Nuclear (%)	32.61
	Standard error	±0.02
	Joint (%)	67.38
	Standard error	±0.02
Type of Houses	Kacha (%)	86.3
	Standard error	±0.02
	Pucca (%)	13.7
	Standard error	±0.02
Landholding size (Acre)	62.92	62.92
Standard error	±4.47	±4.47
Income (Rs)	7459.03	76908.36
Standard error	±919.35	±1197.399
Consumption (Rs)	7235.26	57681.27
Standard error	±891.77	±898.04
Saving (Rs)	223.77	19227.09
Standard error	±27.58	±299.35

Survey(2016-17)

powerful tools to reduce extreme poverty, boost up prosperity, and feed a projected population of 9.7 billion people by 2050. Growth in the agriculture sector is two to four times more effective with increasing incomes among the poorest as compared to another sector (World Bank, 2017). Keeping in view the above aspects, the present study was focused on the socioeconomic impact of Mirani dam in district Kech, Balochistan, Pakistan. The objective of the study is to determine the improvement in the socioeconomic status of the local people after the construction of Mirani dam.

Materials and Methods

The area under Mirani dam Right and Left Bank canal constitute for the area of the present study. This area consists of 24.8 miles of main canal, 8 distributaries canals, and 195 watercourses of about 305894 miles lengths and total 33200 acres of the command area. The total population of the Mirani dam Right and Left Bank canal area was more than 15558 persons (GOP, 1998). A representative sample of 8 distributaries and 371 farm households (211 from RBC and 160 from LBC) were selected for collecting primary information from the field. The statistical data from the field was collected in the year 2016-17. In order to evaluate the

in possession of farm households.

According to the results, obtained from field survey, the average age of the respondents of the study area before Mirani dam was 38 years with a minimum 17 years and maximum 69 years, while after it was constructed, its age increased to 47 years with a minimum 21 and maximum 78 years respectively. The age of the households influences the family to get advantage from the experience of old age person, which is not based on the risk-taking attitude of young farmers.

In the study area the average family size before Mirani dam was 5.23 and after it was constructed, this figure changed to 6.23 with a minimum 2 and maximum 17 respectively. Whereas, the average family size of Pakistan at the national level was 6.45. It shows the study area is close to national level family size (Table 1).

Before Mirani dam 67.38% household lived a joint family and 32.61% in nuclear family, and after Mirani dam 51.50% respondents live in joint family as compared 48.50% of respondents live in a nuclear family (Table 1).

Table 2. Capital assets in possessions Survey (2016-17).

Particulars		Description	
		Before Right & Left Bank canal (2008) Mean	After Right & Left Bank canal (2016-17) Mean
Livestock	Camel (Number)	0.11	0.32
	Standard error	±0.04	±0.09
	Goat (Number)	5.97	24.94
	Standard error	±0.54	±1.85
	Sheep (Number)	0.06	1.27
	Standard error	±0.02	±0.56
	Cow (Number)	0.20	0.20
	Standard error	±0.05	±0.17
Dead Stock	Donkey (Number)	0.09	0.56
	Standard error	±0.03	±0.05
	Tractor (Number)	0.005	0.22
	Standard error	±0.004	±0.02
	Thrasher (Number)	0.003	0.08
	Standard error	±0.003	±0.014
	Harvester (Number)	0.003	0.06
	Standard error	±0.003	±0.012
Others	Bicycle/ Motor cycle /Car (Number)	0.003	0.789
	Standard error	±0.015	±0.021
	Others (Number)	0.04	0.29
	Standard error	±0.011	± 0.02

The average level of education of the respondents is Middle standard. About 46.9 percent of the households in the study area did not read or write and were considered illiterate. Whereas, 10 percent of the respondents have completed five years schooling, 11 percent completed 18 years of schooling, 13.5 percent 14 years or above schooling, 13.7 percent completed 10 or above years of schooling and 4 percent have completed less than 10 years of schooling respectively. The majority of the educated farmers were also engaged in other economic activities at local level. Most of the farmers were illiterate. Such farmers represented 46.9 percent of total respondents in the study area. It was observed by the interviewing these farmers that they were laggard in adopting modern technology for agriculture (Table 1).

improved the crop production, income and socioeconomic condition of people of the area (Table 1).

Before construction of Mirani dam, 86.3 percent houses were Kacha and 13.7 percent were Pucca while after Mirani dam, 59 percent houses were Pucca and 41 percent were Kachahouses (Table 1).

According to the respondents there was no change in land holding size, but it was not cultivated due to unavailability of irrigation water. After construction of Mirani dam, the same land was brought under cultivation. The average landholding size before and after being 62.92 acres and standard error for the same was 4.47 (Table 1). The farmer's income also increased significantly due to availability of irrigation water from Mirani dam and thus, Mirani dam has

Table 3. Correlation between selected variables in the study area.

Particulars		Description	
		Before Right & Left Bank canal (2008)	After Right & Left Bank canal (2016-17)
Age		1	1.000
Household size		1	1.000
Family system	Nuclear	1	.682
	Joint	1	.660
Type of Houses	Kacha	1	-.883
	Pucca	1	-.989
Landholding size		1	1.000
School going children		1	.379
Income		1	.202
Consumption		1	.202
Saving		1	.202

The crop production and income of the people of the study area improved. Before construction of Mirani dam, average 0.80 children went to school while in post Mirani dam average 1.88 children were going to school. The standard error for the same was 0.06 and 0.08 respectively. Shah (2008) and Rahman (2013) argues that the Chashma right bank canal had

played a prominent role in the socioeconomic development of the area. Furthermore, household consumption spending also improved significantly in the study area.

Similarly, the analysis of the data shows that there is a significant change in the household saving in the

Table 4 Correlation among selected capital assets.

Particulars		Description	
		Before Right&Left Bank canal (2008)	After Right&Left Bank canal (2016-17)
Livestock	Camel	1	.751
	Goat	1	.441
	Sheep	1	.099
	Cow	1	.358
	Donkey	1	.404
Dead Stock	Tractor	1	.050
	Thrasher	1	.175
	Harvester	1	.207
	Bicycle/ Motor cyle/Car	1	.170
	Others	1	.006

whole command area of the Mirani dam (Shah et al., 2011).Occupation of Sampled Households

About 84.4% respondents were working as farmers, 12.1% were government employees, 8% were doing their business and 2.7% were working as shopkeepers, masons and others (Fig.1).About 55 percent of people income is spent on food stuff, 20% on health, 15% on education, 10% on clothing and 5% is saved for their future (Fig. 2).

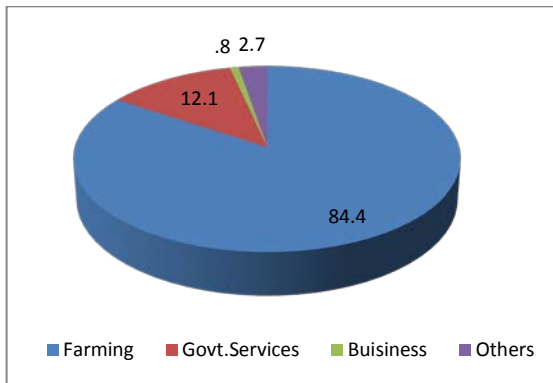


Fig. 1 Occupation of sampled households

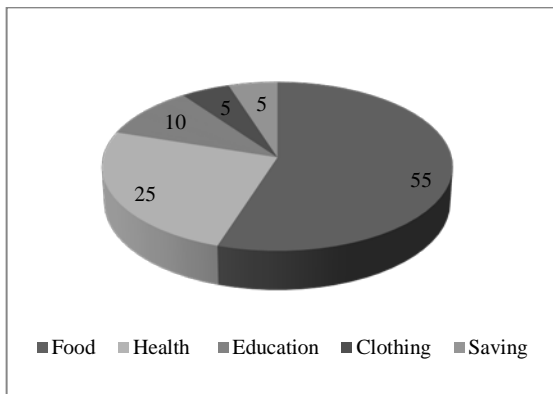


Fig. 2 Expenditure of sampled households

Capital Assets in Possession

The capital assets in possession of sample households of the study area were divided into two categories Livestock and dead stock (Table 2).

Livestock

The survey showed that households in the study area had different kinds of animals such as camel, goat, sheep, cow, and donkey. Like other similar studies, it was measured in terms of tropical livestock unit (TLU). The result shows a significant increase in all categories of animals after construction of the Mirani dam because the forage was easily available for animals and the people of the study area who can rear more animals (Table 2).

Dead Stocks

Dead stock may be defined as machinery or farm tools and equipment used on a farm, as opposed to livestock. These machineries include tractors, harvesters, plows, threshers and bicycles/motor cycles and cars.The result shows a significant increase in all categories of dead stocks after construction of the Mirani dam because more area brought into cultivation and the people of the study area needed more dead stocks (Table 2).

Pearson Correlation

The Pearson correlation coefficient was analyzed between selected variables, which shows a positive correlation among all analyzed variables (Table 3). The strong positive relation was observed between age before and after, household size before and after nuclear and the joint family system. Whereas, a negative correlation was noticed in kacha and pucca houses because the number of kacha houses after construction of Mirani dam decreased and pucca houses increased. A weak positive correlation was seen in school going children, income and consumption and savings.

The Pearson correlation was also analyzed among selected capital assets in order to find the relationship between different categories (Table 4).

The correlation results of different capital assets varied from positive to weak positive or no relation. Results showed that there is a positive correlation in number of camels, goats, cows and in number of donkeys after construction of Mirani dam. However, there is weak

and positive relationship of other capital assets such as tractor, harvester, thrasher, and bicycle/motorcycle/car.

Conclusion

It is concluded that the Mirani dam played an essential role in the development living standard of the local population and the study area. Due to Mirani dam irrigation water became available for farmers and their livestock. As a result the area under cultivation, standard of living and literacy ratio also increased in the study area. Availability of irrigation water contributed to increase cropping and land use intensity in the study area. The income level consumption expenditure and saving of the inhabitants increased significantly. The study further summaries that, due to extensive and intensive farming, crop production has increased manifold in overall command area.

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