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## Canal Irrigation, a Shifting Mechanism for Society: A Study of New Irrigation Practice in Southern Punjab, Pakistan

ABDUL SAMAD

Department of the Anthropology  
Quaid-i-Azam University, Islamabad, Pakistan

WASEEM KHOKHAR

Area Study Centre  
Quaid-i-Azam University, Islamabad, Pakistan

MUHAMMAD BURHAN

Department of Sociology  
University of Sargodha, Pakistan

MUHAMMAD AAMIR RAUF

Department of Sociology  
International Islamic University, Islamabad, Pakistan

MUHAMMAD FAHEEM TARIQ

Department of Sociology  
International Islamic University, Islamabad, Pakistan

### Abstract:

*The focus of the present study is to highlight the importance of the new irrigation practices and how it is proving an altering mechanism for the social institutions of the society. This study will highlight the shaded realities behind the development projects. New irrigation practices at the village not only a source for the betterment of the economic condition of the people but it also have deep rooted bases for shifting the economic as well as social structure of the society. The principal aim of the present study is to focus on these particular social factors that have been introduced through new irrigation practices at the locale. Another interesting aspect of the present study is to document the variations in the social relations due new irrigation practices especially after the execution of the canal irrigation. The data presented in this paper has been collected by using qualitative anthropological and sociological research methodologies.*

**Key words:** Peter Engine, Nala Massu Waha, Mungi, Ganwara, Dhota Darya.

## **Introduction:**

Agriculture is principal economic source of Pakistan. It has been trying since many decades to enhance the agrarian economy through multiple ways. The ways to multiple the agrarian economies has been varying throughout the agricultural history of the Pakistan. The irrigation is a key source for agricultural development. Irrigation system in the Pakistan is one of largest irrigation system in the world. So it is considering a central force to enhance the agricultural productivity in particular agrarian zone.

The introduction of the canal irrigation in a particular zone is has multiple dimensions. The dimensions of the canal in agrarian zone are fluctuating from the level of the government and from the level of the community. The emphasis of the present study is to focus the level of the community and their perception regarding the canal that how it is a source of reshaping the society. The introduction of the canal in particular zone at its early stage consider a vital source of economic and agrarian development, but with the passage of the time its multiple socio-cultural factors have been noted by the people in the zone that have a central role reshape the society in different ways.

The shifting mechanism of the canal irrigation identified after one decade of its execution. The agrarian modes at the locale have changed. The new agricultural technology has been introduced which not only help the farmers to multiple their crop production but it also have changed their residential patterns. The settlement patterns have been changed and migration to the Canal Zone has been weakened their social bonds at the village level. Social role of the gender

has been changed at the household levels that also replace the past social structure of the society. The social relations at different economic and social levels have been changed. Hence, the canal irrigation not brings changes in the agrarian patterns only but it is proving a shifting mechanism for the society in holistic sense.

### **Methodology:**

Qualitative anthropological and Sociological research methodologies which include methods like Socio-economic survey, participant observation, key informants interviews and in-depth interviews were used to collect the empirical data. Different sampling techniques were used during the research like purposive sampling, random sampling and snow ball sampling. By using these sampling techniques 100 households out of 300 households have selected as sample of study. Beside this structured and unstructured questionnaire and in-depth interviews have been used during the study. Modern methodology like photography and recording have also used during research. The research conducted in four month from February 2012 to June 2012.

### **Results and Discussions:**

#### **Economic patterns**

Before the formation of Canal there was a lot of poverty in village, people were selling their land and even jewelry of their wives to fulfill their basic needs, while there was no industry, 90 per cent economy of the village depends upon agriculture. Before CRB Canal there was no irrigation system in the village, people cultivated at small scale with tube well and *peter engine irrigation* water which was very costly, therefore the agricultural activities were meager and the wheat was cultivated for the domestic purposes only. To fulfill their

economic needs, 80 per cent people worked as wage labor in different urban areas and industrial cities like Karachi, Lahore, Faisalabad, Multan etc.

According to Musa Khan:

“Before canal formation we used to do labor work. We worked in wheat harvesting season to collect grains for whole year. We used to Sindh and Thal for wheat harvesting. We went in groups. Every group consisted of fifteen members. One old and experienced man was the leader or head of this group, but after Canal formation we started cultivation in our village. We used to take agriculture land at “Patta, muzairgeeri and 1/8<sup>th</sup> part:” and cultivate it and generate revenue to live. We are prosperous and happy now because we get an employment at home” thus before the formation of Canal the economic condition of people was not good.

### **Agricultural mechanization**

After the working of the Canal agriculture, the agriculture was intensified and modern agriculture technology was introduced by the local landowners. According to the respondents, the yield per acre has increased after CRB Canal, while before the wheat production with tube well and *peter engine* irrigation was 1000kg per acre but after the Canal formation, wheat production increased to 2000 kg per acre which has improved the economy not only at household level but also at the village level.

According to a respondent *Musa Khan*:

“We get surplus production after the formation of canal while before the canal formation surplus production was very low.”

After the Canal, grazing area was also increased, according to the survey conducted by the researcher during the field work, 75 Per Cent respondents’ response was the increase in the grazing lands with the blessings of Canal irrigation water that resulted in augmenting of domesticated animals and increase in milk and its products.

According to a respondent Musa Khan:

“I had no cattle before canal formation but after canal formation my economic conditions improved and grazing land increased, thus I have now nine cattle. This is because of modern agriculture technology that has introduced after the formation of Canal.”

The local markets emerged after the Canal formation, the people of the village sell their crop production there and purchase fertilizers, seeds, pesticides and other related commodities, they were happy with the establishment a market in the village that facilitated them to fulfill their requirements within the village that saved them from taking their crops to the urban centers by spending handful of money on transportation. The cropping pattern was also change after the formation of the Canal that promoted the economic development of the village.

Before the Canal, the famers of the village cultivated traditional crops like wheat, rice, cotton etc, but the concept of cash crops was introduced due to the formation of canal like sugar cane. Sun flower, Vegetables, *Mungi*, *Ganwara* that has contributed much towards the betterment of economy of the village. Fruit farms and plantation was increased after the formation of Canal that increased the economy of peasants and also decreased the environmental pollution to greater extent. Moreover, it also facilitated the famers to use modern agricultural technology like Harvester, Ripper, Drill machine, Pesticide spray machine, Rigor, Mechanic plough and a machine to inject fertilizer in the cotton crop. According to survey questionnaire conducted by the researcher during the field work, before Canal formation there were three tractors and few agricultural tools in the village but at the time of field survey, there were 50 tractors and other numbers machines and equipments available with the farmers.

## Vehicles and agricultural machinery

Sr.No	Vehicles and Agricultural Machinery	Before the formation of canal (2002)	After the formation of canal (2012)
1	Tractors	03	50
2	Motor cars	04	52
3	Motor bikes	31	307

Source: Field data

The available vehicles before the formation of Canal were 4 in the village but after the formation of the Canal, according to survey questionnaire, there were 52 vehicles and 307 motor bikes in the village indicating the higher economic development of the village.

According to Musa khan, the increase in vehicles and agricultural technology created a lot of employment opportunities for the natives. His son started tractor driving and was enjoying a better employment afterwards and earning thousands of rupees a month.

According to *Musa khan*:

“After Canal this type of economic development created many opportunities for natives, young men who went to different factories in other cities for employment. Many of them have come back now and have started cultivation, tractor driving etc.”

After the Canal formation, crops cultivation was intensified, the farmers were cultivating crops at business level while before the Canal, the agriculture activity was at very low level and as a result the socio-economic condition of the people was not so good because of non-availability of irrigation water and non-use of mechanized machinery.

### Case study

Ghulalm Farid was thirty years old man having six children engaged in agriculture since 1990 told the researcher that he

lived in the mountain range where there was no water and other basic necessities, the dependency was on the on rain water which was store in the ponds made by the villagers for the human beings and cattle use but was causing different diseases. In 1995, his family migrated to the village *Banbhan* where some of their relatives were residing.

He started cultivation with tube well irrigation on a small scale but after 2003 with the formation of CRB canal, he cultivated more land with the Canal water by acquiring land on Patta and *muzairgeeri*. He worked hard in agrarian activities and earned a lot through cultivation with canal irrigation and purchased agriculture land and also a house in the village and afterwards purchased four tractors. The prosperity was brought with the Canal water that increased the volume of cultivated land, increased the crop productivity with the use of agriculture technology and introduction of hybrid seeds and modern fertilizers.

### **Outcomes of the case study**

The main features of the case study that were related to the Canal irrigation significantly improved the social status of the people of village *Banbhan*:

- Internal migration started after CRB Canal;
- CRB Canal introduced new agricultural technology and changed cropping patterns;
- CRB Canal introduced new survival strategies among the people;
- Economic development started after the formation of the Canal.

### **Replacement of old irrigation system**

Before the canal, there was no proper irrigation system in the village *Banbhan*, farmers were cultivating their small lands with the insufficiently available water of *Nala Massu Waha* and Indus River called *chota darya*. *Nala Massu waha* used to flow

from April to October. People cultivated rice and different types of grass through the natural irrigation system and crops were cultivated at small scale. In the start, the water of *Nala Massu waha* was more than sufficient for the irrigation purposes and the crops production was better but with the passing time, the crop produce declined due to the shortage of water in the main *Nala* and distributaries.

In 1990, *Nala Massu waha* was blocked due to lack of water in *chota darya*. So time from 1990 to 2002 was very crucial for natives of village *Banbhan* because the only irrigation system was non-functional. There was famine in the village during 1994 to 2002, but the position changed abruptly when the CRB canal was introduced in late 2002 that replaced the tube well and *Nala* irrigation system at locale, thousands acres of barren land became fertile, crops intensified and high yield seeds and modern fertilizers was introduced.

**Plate # 01 Old irrigation replaced by canal**



**Plate # 02: Fields after canal irrigation system**



## Economic development and social status

The economic development was obvious through the Canal irrigation that brought thousands acres of barren land under cultivation with the result the crop productivity tremendously increased, people of the village *Banbhan* became prosperous.

According to Hajji Ramzan, a respondent:

“Economic development with Canal also improved the social status of natives. He said before canal some people of village know me because I used to spend my whole day with cattle herd. Now after canal my sons started cultivation their barren land with canal irrigation. I have hundred acre lands in Canal Zone. Thus with cultivation of crops over hundred acre land our economic condition has improved. Now we get three laces rupee land rent per year. We bought a tractor and other agricultural instruments. I sold my cattle herd. Now I am at my Bethak and offers prayers. Now people called me Hajji Ramzan. Thus the economic development after canal formation has improved the social status of natives.”

*Patta* rates were from Rs 8000/- per acre per year but after the availability of water for irrigation purposes through Canal water, the *Patta* rate increased to Rs 25000/- per acre per year. The increase in *Patta* rate indicated the economic development at the village level after the formation of Canal. Cattle farming was also increased with the availability of grazing land in abundance due to the Canal water. There were 6 cattle farms in the village, while each and every landowner's household had domesticated animals.

Another impact of Canal on the economic development was the support provided to the local *mandi* (market) called in the native language *Nari wali mandi*. It started in 1978, initially it was located in *Nari shumali* but with the boasting economy, the space became inadequate and the *mandi* was moved towards the north along the right side of Indus high way but afterwards it was shifted to the village *Banbhan* in 1995.

Researcher conducted interviews at *mandi* from shop keepers, cattle traders and customers to high light the impact of Canal on *mandi*.

According to Gul Jam, a shopkeeper:

“Many ups and downs used to come with *mandi* with the passage of time but changes on *mandi* for last twelve years are very important because CRB canal economic conditions of people have improved. Their purchasing power has increased thus our work has increased. Thousands of people have got an employment at *mandi*.”

According to Gul Jam, as an impact of canal water irrigation, the cropping patterns have changed. People started cultivating vegetables with the fresh and clean Canal to meet the village requirements; the vegetables were available in abundance and on cheaper rates in the village market. The Canal also has its impact on the market (*mandi*), the ownership of the market was moved from outsiders to a local that was a step towards independence and prosperity of the local people, along with other socio-economic factor, *mandi* was also contributing for the betterment of the people of the village *Banbha*. The development of cattle *mandi* was another significant development in the village that was also the blessing of the Canal.

According to survey conducted during the field work, number of domesticated animals has increased to 90 Per Cent after the canal as indicated in the table below:

#### Animal Husbandry before and after Canal

Sr.No	Cattle	Before the canal ( 2000) Per Cent	After the canal ( 2012) Per Cent
1	Cows	30	75
2	Buffalos	20	63
3	Goats	42	87
4	Sheep	35	67

Source: Field data

### **Bandi (Blockage of water)**

After the formation of Canal, cropping patterns have changed in the village *Banbhan*, before it people used to cultivate traditional crops like *juwar*, *bajraa*, *ganwara*, *maize* etc, but after it people started cultivating cash crops like sugar cane, sun flower and cotton by changing the cropping patterns due to easy availability of water, while the production of cash crops also increased than the traditional crops with less expenses than before.

But there was a problem for the peasants due to *Bandi* of Canal, in the initial time of Canal formation, *Bandi* period was 15 to 25 days that increased to almost 50 days creating problem because cash crops need irrigation water after each twenty days. Thus since 2008 production of cash crop has reduced due to *Bandi*, farmers were looking for the alternative means of water during the *Bandi* days.

*Bandi* of Canal has reduced the cash crop production as well as it reduced the household economy of peasants and increased crops expenditures. With intensification of crops in the Canal Zone has created new ways of employment for labors, thus the economic conditions of labor has improved after the formation of Canal.

### **Economic development of labour class**

Before the availability of Canal water, there was no job opportunities for wage labors and rates of wages were very low as Rs. 200/- per working day that increased to Rs. 400/- per working day after the functioning of the Canal. There were many labor groups in the village emerged as a result of working opportunities available to them with the growing agriculture in the village *Banbhan*, some of the groups were:

- Daily wage labor groups;
- Pallydar groups;
- Harvester labor groups;
- Bricks bhatta labor groups;

- Camel Carts Labor groups;
- Female labor groups.

### **Daily wages labour groups**

Daily wage labor groups work on daily basis consisted of four to six members engaged normally with the maintenance, construction and cleanliness of water courses. The groups gained more strength after the construction of Canal because their availability was demanded frequently by the irrigation department for keeping the Canal running smoothly, while the labor was getting wages to tune of Rs. 400/- to Rs. 500/- per working day.

### **Pallydar groups**

The *Pallydar* groups were having membership of five to ten members; they work in the fields in different season for the landowners and in the grain markets. The groups have gained their popularity and their demand has increased due to intensification of crops after the Canal formation. The groups worked for loading and unloading the grain, cotton, sunflower etc, into the vehicles to carry the stocks to the market, similarly, the group members at the markets provide their labor services and were paid daily wage of Rs. 25/- per kg according to the weight.

### **Harvester labour groups**

The membership of groups was consisted of ten to fifteen members, the labor the group worked in the fields in harvesting season only. As the agriculture has tremendously increased in the village due to availability of water in plenty from the Canal, their demand has also increased; they mostly worked for harvesting wheat, cotton buds and sun flower. The groups were mostly stationed in the *Sulman* mountain range, while some of the laborers were also from the village, they were getting Rs.100/- kg grains per acre.

### **Female labour groups**

Female labor group emerged after the Canal consisted of ten to twelve women headed by an old woman who contracts the landlords in different sowing and harvesting seasons for providing labor force, while she was the sole authority to fix the rates of per day labor with the consultation of the landowner in accordance with the increased rates as a result of Canal irrigation. They were provided with the wages on the basis of working day along with pick and drop facility by the landlord. The female labor groups work throughout the year to supplement their household economy, while the women of the labor groups were gaining respect and honor within their families for the reason of earnings.

### **Change in household and family structure**

According to M. Harris, when changes comes in material culture it also brings changes in infrastructure, structure and superstructure of the society. The CRB Canal was a massive change in material culture of the village *Banbhan* that has changed the infrastructures, structure and superstructure of the village. With the economic development after the Canal, household structure has also changed completely.

According to *Mehar Dad*:

“The living standard of natives has improved. The structure of their houses, food patterns, marriage patterns, dress patterns have changed that indicate economic development after the formation of canal. Before canal 90% houses were made with mud. There was no concept of Bethak with houses. Mud houses were consisting of two to three rooms, one room for household use other one for cattle and third one was used to keep bhosa for cattle.”

The households structure was completely changed in the village, people have started making their houses with bricks, according to data collected the families making brick houses were 90 Per Cent among the total families residing there, while

the concept of constructing separate sitting place *Bethak* was in frequent practice by almost 30 Per Cent households. The houses made with bricks and cement was having spacious accommodation consisting of four to five rooms with TV lounge and garage etc.

### **Case study**

Allah Baksh was sixty years old man lived in a mud house consisting of two rooms having no boundary wall, a room was used for domestic purposes, while other room for the domesticated animals. He told the researcher that after the availability of Canal water, he started cultivation and got reasonable revenue from agriculture. Before five years his wife and sons asked him to construct brick house, he told them to wait for a year as and when the rent of the land was received from the tenants, the house would be constructed. Exactly same was happened, when a handful of money was received from the tenants, the house was built by adding the previous savings into the total expenditure. The house was consisted of four rooms; two were made with bricks and mud for the use of cattle, one room for domestic use and other for his son. The boundary wall was also constructed around the house to safeguard the premises and its belongings, while a steel gate was also fixed at the entrance of the house. The family was happy for having a bricked and spacious house that was the outcome of the Canal.

### **Outcomes of the case study**

- Canal irrigation replaced the old houses structure with modern touches;
- It fulfilled the basic needs of the natives;
- Provided hygienic livings standard to the natives.
- Helped to provide security and introduced concept of *pardha* according to the local culture after the construction of boundary wall around houses.

### **Role of women in development of household economy**

After the introduction of Canal, women contribution in household economy has increased and it was not just limited to men. Before Canal women contribution in household economy was very low as 10 to 25 Per Cent by participating in different working activities that were:

- a) Women of the village contributed in their household economy through different embroidery work on *dupatta* and were getting 30/- to 40/- rupees per *dupata* to extend their contribution to the household economy. Embroidery work on shirts and cover cloth of different types used at domestic level were very popular there and were most wanted for giving gifts to relatives and friends on different occasions.
- b) Women before canal also contributed in household economy by making different things with *Peesh*. Most common things made with *Peesh* were *changair*, *pankha*, carpet, *jaie Namaz* etc. some women were very expert in the work. First they dye the *Peesh* with different colors then made things of different types. Thus they contributed a lot in household economy.
- c) The other contribution of women in household economy was through work as daily wages. These are different types of works, harvesting wheat, rice sowing and cotton budding where the women were participating for earnings.

After the Canal, women contribution in household economy has increased from 25% to 48%, their contribution in household economy was through cattle rearing, helping their husbands in agrarian activities, participation in daily wages agrarian activities etc. after canal irrigation cropping patterns have changed and crops have intensified with the women contribution in agrarian activities for helping the household economy due to the increase in the wages after the Canal, the

wages before the Canal were Rs150/- per day that were enhance to 300/- to 400/- rupees per day after the green revolution in the village with the Canal irrigation.

### **Case study**

Allah Wasai a widow of the native village had five children told the researcher that before the death of her husband, she was happily living because her husband worked and eared for them, but after his death, total responsibility of children and the household came upon her shoulders. In the start she was very much worried about her children's future but when the Canal formation completed in 2003, she formed a female labor group consisted of 11 women headed by her. The group started agricultural work of different types like harvesting, sowing in the fields of the landowners on reasonable daily wages.

She further said that she earns much from the labor activities; later on she inducted her daughters in the group for increasing the household income. The landowner of the fields where the group was performing its labor activities was providing pick and drop facility to the group members. The Canal has proved itself a great blessing of Allah to her and her children for providing livelihood opportunities.

### **Outcome**

- CRB canal provided equal opportunities of employment to men as well as women;
- Women contribution has increased in household economy;
- Canal irrigation has improved the social status of women because their economic contribution has increased;
- Canal irrigation has alleviated poverty at micro as well as at macro levels;

- Canal irrigation provided the opportunities to fulfill the basic needs and desires of the poor people of the locale.

## **Conclusion:**

Social change is multiphase phenomenon. It has deep rooted in the culture of the particular society. Social change has also related to the material conditions of the certain locality. The economic conditions of the particular geographical setting have deeply connected with social change. Agriculture is a central source of economy in the Pakistan. For the betterment of the agriculture, irrigation's role is very essential. An irrigation practice has not limited its role just to advance the agricultural economy of the society but it has many other modes that are generally unseen.

Irrigation practices have replaced old agriculture technology and introduced the modern technology that is not only proving helpful in increasing the agricultural productivity but also replaced the old irrigation practices at the locale. Betterment in the economic conditions of the masses has changed the nature of the social relations at the locale. The settlement patterns of the people at locale have been changed. The relations with the neighboring villages have been improved to get easy access over the canal water. Relations among the various social groups have been changed for their economic purposes. The role of the gender and the social status of the women have been changed to get control or enhance the economic resources because women have a key role in the field of agriculture at the village level.

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