

A note on supporting farmer managed soil bunds systems in the Kacchi Plains 1984-1990

The Kachhi plains in Balochistan , Pakistan are a fast alluvial plain, where most agriculture is based on spate irrigation. There has been relatively little external intervention in the area, basically because the nature of these sandy plains is such that it is difficult to invest in meaningful civil works. Instead however there has been successful support to the traditional systems of building very big soil bunds. This note documents some of these efforts by Pakistan German Self-Help Project for Rural Development and later on its successor the Balochistan Rural Support Program (BRSP).

Development work of the Self-help project and BRSP was mostly related to flood protection, water storage tanks, and village protection bunds. The results achieved so far by these community oriented schemes are discussed here.

Prior to 1984 there was lack of water due to absence of diversion structures across hill torrents in the area. Water used to pass the area but controlling and diversion was within the reach of the farmers of the area. As a result the main livelihood system was nomadic farming. In the past however Kachhi region alone used to provide 80% of revenue for former Kalat state. This revenue was levied on produce from spate irrigated agriculture. In 1984 first and mid users had no capacity to construct the earthen structures due to heavy work involved. This heavy work was caused by extra ordinary floods when most of irrigation structures in the areas were destroyed. Water used to flow down streams where farmers had not much rights against its flow availability. As a result of drought like conditions local population worked mostly as tenants in union Jalal Khan. Many had left the area and went to other areas - most of them got settled in Patfeder canal area in Balochistan and canal areas of Sindh province.

At a preliminary stage enough information were collected and discussion started with the few remaining farmers resident in the area. Various government departments such as Revenue, irrigation and local government were consulted. The irrigation department had all its expertise in cemented structure and therefore, were not in favor of the developing of large soil bunds and earthen structures. Local government has less technical capacity as it was a "mega" project for them. Project technical and social team took responsibility to complete this task together with villagers.

In farmer consultations it was decided by mutual understanding that site near Rehanzai village where river Bolan and Nari meet is suitable for this structure. Mugheri chief wanted to name the dam as Jalal Khan dam but then one person (non Baloch) from Bhag town convinced the council of elders to name the dam after a village near to dam site - Rehanzai . This was accepted uniformly. At this stage there was not much population in the area but Sardar Sherdil Khan took responsibility to bring back some people required for dam work.

It is important to note that few years back one Hindu money lender had invested in construction of small diversion structure in this area. He got major share in produce against investment in the structure. This was acceptable to local landowners and farmers as there was no hope from government to support this scheme.

Survey was conducted by field engineers and local population took part in it substantially. After survey, design stage came and local population was again consulted as local knowledge importance was much appreciated by project. Local population insisted for cemented structure and argued that traditional earthen dam will not last for many years. They actually wanted to get more and more concessions from donor side. For this purpose several discussions were held with communities and technical aspects was explained. Project wanted to use local material, local knowledge and expertise, does not harm environment and also could not afford any high cost structure. Project also did not want to risk by investing in any cemented structure as there was no precedent of cemented structure on these spate irrigation systems before. Moreover project even did not have any expertise in this type of heavy cemented irrigation structure. Provincial government supported the idea of cemented structure but could not help in low cost design. Conventional cemented structure would have cost more than 20 million rupees at that time. So it was decided to follow the traditional irrigation system with blend of modern skills and local knowledge and expertise.

Construction work of Rehanzai dam was started near Rehanzai village in union council Jalal Khan, district Kachhi in September 1984. This is an appropriate site where river Nari and Bolan meet. The area has not been cultivated since last 20 years except for few patches of lands from over flow of flood water. Dam was constructed on self-help basis where traditional contribution (*gham*) was applied, though not on a full scale as many people were not residing in the area at that time. Gabions were used in the foundation of dams' main wall and rest of work was performed by bulldozers. Bulldozers were hired by the local population on behalf of project. Local labor did the manual work including compaction, dressing of walls, digging space for foundation, preparing gabion, filling of stones, and other related work.

In total Rs . 1.1 million (USD 35000) were spent on this project where 0.3 million was contribution from local farmers and landowners in different forms. It is note worthy that bulldozers hired from community side has also potential saving of Rs . 0.8 million as machinery was hired on subsidized rates only allowed to farmers.

Main wall of Dam is made of earth with gabion filling in the bottom and long side walls. Side walls help to spread the water so that pressure during peak flood hours is equally distributed over a larger area. This helps to increase dam life and slowing the intensity of flood water. Local technology, material, and expertise and supervision have helped to strengthen the structure.

Two side channels were kept on eastern side to release share of water for that area as it was assumed that water may flow more on western side due to slope. Many of shareholders from eastern side were poor and not from main tribe but project team helped to incorporate their interests in new design. The main body along with side walls was completed in March 1985. The irrigation channels on eastern side were completed short after it and before first flood of July 1985.

The first heavy flood reached here on July 1 st , 1985 and luckily dam could survive. Dam survival has great impact on confidence building among local population about Pak-German Project.

First three years has provided enough water in up-streams of dam and many farmers installed lift irrigation schemes to cultivate lands for wheat and some commercial crops such as

vegetables and oil seeds. This storage reservoir has been extremely beneficial for migratory and local birds.

Later on the storage capacity did not allow for any major lift irrigation but helped a lot for natural plantation growth - first ever seen in this area. This plantation has helped a lot for all construction purpose for newly villages and people obtained fuel wood from here. Moreover, this also became refuge and abode for wildlife.

Water flow and storages in river bed has helped a lot to dig wells of smaller size. These are sued for drinking water purposes and up to some extent fro animal water consumption also. These are unique wells only found in such regions of spate irrigation areas. These are rectangle shape and hardly 25 feet deep. Local population has knowledge about soil which can hold water and then such wells are dug by hands. Water is taken by bucket from these wells. Since it is seepage water therefore water accumulation in well bed takes time to accumulate. Usually two times day water is taken and then resting period is left for seepage and storage enough for next time/day. Such wells can fulfill the demand for three to four months. These are many wells in a single locality very close to each other and every village/hamlet has its ownership and user rights. Absence of spate flow means drying of water in wells and thus further results in migration to other areas.

Before the construction of dam, population of union council Jalal Khan was hardly 2000 persons living throughout the year. After the construction of dam and cultivation, population increased to 20,000 in fiver year period.

Construction of Rehanzai dam (Ghandha) brought significant benefits for population in this area. First year 30,000 acres were irrigated after an interval of 20 years. This has not only led to an increase in cultivated area but has also become the source of water in the tanks for domestic and animals use. Beside this due to permanent availability of water people have started settling permanently. The controlled water availability due to Ghandah caused a rise in the price of land in the area. Prices per acre rose to Rs . 3000/ per acre in 1990 as compared to Rs . 300/in 1983.

Before the Ghandah construction people could not stay permanently as there was not enough water available for domestic and animal consumption for much of the year. Keeping in view such problem construction of one water tank was agreed between villagers and project for every existing and future village. Such schemes were made with the self-help contribution from the villagers. Water storage tanks helped in construction of their mud houses, for permanent settlement. This resulted in increase in the number of animals which were later on used for agricultural purposes, especially to increase the size of cultivated area.

There were only a few water points in the area before the project intervention. These were earthen tanks and various low level sites in the bed of streams. The low quality earthen tanks without proper repair and maintenance and with insufficient storage capacity were miles away from the villages. They were not meeting the consumption requirements of users more than three months in a year. Then the people used to migrate in search of water to the other areas. Farmers asked project for helping in construction of water storage tanks in their villages. Since there is no underground water suitable fro drinking at all therefore earthen storage tanks are filled with spate flow. Scheme of water storage tanks was considered as the turning point in the development of area. According to one VO chairman, "I have never seen such clean water in my life in this area". Spate flow in these areas has multiple uses and precious and

major resource. Agriculture, construction, drinking, washing, bathing and tree plantation are major uses for local population.

Water storage tanks helped to increase income as they could sell their fodder to nomad tribes visiting winter pastures in the area. Now fodder had more value where water tank was available in the village. It is customary to sell fodder together with use of animal drinking water rights. Survey conducted in 5 villages of UC Jalal Khan indicate that out of 127 respondents, 71.70% got direct financial benefits as unskilled labor from the construction of surface water storage tank. Water storage tanks has helped farmer to concentrate more on land development, abolish migration practices and stay in the area. Village protection bunds mad through financial help for project has helped to generate capital at village level as local labor was only used. As a part of policy 25% of wages should be deposited into a village organization saving account, though individual entitlement remained valid.

The design of water storage tank was not acceptable to villagers in the beginning as it has more depth as compared to traditional design where length and breadth was more. However, first filling of tank proved the design benefits as depth of water is directly related to evaporation and seepage losses. The new design water tanks could hold water for 8 months as compared to old design where maximum three months storage was possible.

Development schemes up to May 1990 were as follows:

S. No.	Schemes	Completed
1	Surface Water Storage	16
2	Village Flood Protection Bund	12
3	Erosion Control	1
4	School Building	2
Total		31

As one can see that many schemes in this area are related to natural resources conservation; flood protection bund, surface water storages tanks, and erosion control - these are 29 schemes related to flood water out of total 31 community development schemes (M& E Report 1990).

Right after the first flood water came in 1985, people started to construct houses to live permanently. But in the following years their houses were damaged regularly by the flood continuously. The intensity of damage to their houses was medium to high - partial and full damage. Many of these villages have no more problems from the flood water to their houses. It has eliminated the risk of flood and made them safe. The heavy floods water did not damage it at all till now.

The difference among conventional irrigation schemes and Jalal Kha dam is that irrigation project was a holistic approach which usually lacks in government infrastructure schemes. In typical irrigation structure after completion is left as such and water availability is enjoyed by few influential and rich people as they are only people who can further progress in the form of immediate input and investment. Many people can't take advantages due to limitation of capital and other inputs as they are poor. Gradually the gulf between rich and poor increases and usually poor people become more dependent upon few rich people. Here in case of Rehanzai Khan dam there was full fledged holistic approach with a staring field based team

who could address the issues related to investment in the context of newly built Rehanzai dam.

Rehanzai dam has brought significant changes in socio-economic and political scenario in the area. Population increased and thus development schemes from government side also increased simultaneously. Prices of land increased. One of the most important results is that productive value of land increased tremendously. This was two edge sword - landowners having big holdings saw it as threat from revenue department for recovering against land reforms act. They started disposing these lands slowly and gradually. For tenants and farmers it was an opportunity to buy lands in this context. During our work in 1990 we could hardly see any tenant become landowners even after five years of dam completion. However, during our work in 1994-95 we have observed that at least 40% tenants became landowners in this area - first time in their known history.

Sonwah dam is another example of community participation, environment friendly project and equitable scheme in its benefits. It is in union council Mehrum district Kachhi . Through spate irrigation schemes controlled water and equitable distribution offer reliable agricultural practices chances in the area. Risks are avoided through community participation approaches and this is what farmer would prefer as his survival and investment strategy always. Mehrum union council was brought under irrigation after 25 years. This scheme has actually helped to further distribute water in Kachhi plains instead of concentration in one or few areas only. Revival of agriculture means basically revival of settlement pattern once abandoned due to uncertainty and scarcity of water.

During village organization convention held in April 1993 local contribution based on agreements of 100 years back was drastically changed. It was made possible through strengthening of water users association and village organizations. During this convention share of *Gham* was doubled. Nearly half preservatives deposited the money at the spot to water users association. It was a big success in revival of spate irrigation system in the area.

It is alone not enough to mention increase in human population but at same time animal population increased tremendously. Livestock keeping is a part of production system where this asset is not shared by landowner and is a sole property of tenant. This area is abode of two native breeds, i.e. Nari cattle and Balochi sheep. Sonwah and Jalal Khan Dam have helped in restoration and improvement and increase in number of these two breeds. Moreover, nomad tribes received heavy benefits for their animal development and increase in income as fodder availability was reliable and cheaper. This has again contributed a lot in overall economy of province and country.

Development of spate irrigation in Kachhi plains has positive impact on overall economy and environment of Balochistan especially of highlands. Highlands are the summer camps of nomad and here present day heavy population concentration in the form of sedentary villages is more what human history is evident now. Spate irrigation functionality means more fodder and resources attractable to nomads for longer stay in winter camp areas. Just a three weeks more stay of nomad tribes in Kachhi region means extra ordinary positive effects on vegetation in highlands. As visiting time is delayed in highlands, shrubs and other vegetation have more chances of regeneration and sprouting otherwise were eaten up immediately after sprouting. Recovery of vegetation in highland is further related to decrease in soil erosion, increase in pasture improvement, runoff and precipitation infiltration improvement leading towards more sustainability. So only a single activity at low land has directly co-relation with

highlands improvement - usually not taken in this way during formulation of any regional planning strategy in the province. The centuries based migrating system is more close to nature and sustainable use of natural resources if applied properly and still have capacity to offer alternatives to present day development planning.