WOMEN AND WATER

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Introduction:

Against the backdrop of anti dam demonstrations in the three provinces of Pakistan in response to the announcement of Prime Minister to build Kala Bagh dam, Pakistan seems at the crossroads of its socio-political and economic reforms. The extent of pressure on water resource capital and of the country, non-recognition of women's role in water resource management and its negative impact on other natural resources which in turn caused economic crisis, make it imperative to consider women and natural resource -management as an integral part of any short and medium term plans to jump-start the economy and deepen socio-economic reforms. It is therefore important to evaluate, based on lessons learnt locally and internationally, what went wrong, what has worked and key strategic choices need to be made to ensure gender and environment considerations are fully integrated into all social and economic development plans for a sustainable development.

This presentation is divided into five parts. Part one deals with the water needs and the availability in the country, part two emphasize the role of women in water management, while the part three and four explores overall causes of so called water crisis and its overall impact on the environment and women. Part five emphasizes the role of women in water conservation and its positive impact for economic gains for the whole community.

1. Water Needs and Availability:

Of all the planet's renewable resources, freshwater may be the most unforgiving. Difficult to purify, expensive to transport and impossible to substitute. Water is essential to food production, to economic development and to life itself.

While the World's oceans may seem unbounded, the amount of fresh water actually available to people is finite. For the sustainable use, water can not be withdrawn from reservoirs and other sources faster than is replenished through natural hydrologic cycle. Life is tied to water as it is tied to air and food. And food is tied to water. Fresh water availability is dictated in large part by climate, timing and location of precipitation and by "atmospheric evaporative demand". Water availability can vary tremendously from season to season causing distinct wet and dry seasons. Socio-economic factors greatly influence access to water. Within a country powerful industrial and agricultural interest may claim a dispropotionate share of water resources. People with least status and wealth often suffer dis-propotionately when supplies are limited.
uoumries wun iess man **i** , iuu cubic meters per person experience water stress; tnose with less than 1000 cubic meters per capita, water scarcity. When countries were ranked by 1990 fresh water availability it showed that the total annual renewable fresh water to Pakistan is 4,67,999 million of cubic meters and per capita availability in 1990 was 3,962 cubic meters per capita. Pakistan with 2,035 cubic meter per capita, ranks eighth in per capita fresh water with-drawls among the 130 countries listed in 1995 World Development Report. It does not show the disparity that is inherent in the different parts of the country in terms of accessability to this vital resource. Unicef's 1998 report shows that 74 percent population can access safe drinking water, out of which 82 percent reside in urban areas and 69 percent in rural dwellings. Forty seven percent have access to adequate sanitation, out of which 77 percent in urban and 22

percent in rural areas. So far Pakistan falls into the water abundant country but with its increasing population and increased demand for water supplies to grow grains and run the industries, the availability of fresh water per capita will decrease sharply.

Usage of Wafer Sector-wise:

Worldwide agriculture accounts for 73 percent of off stream water use, industry 21 percent and residential use 6 percent, though specific amounts vary considerably from country to country.
Water is required for household needs, for industry and for agriculture. Household needs-drinking, washing and cooking-could be adequately met every where in the world by less than 100 litres per person per day. Of this only one litre a day is required for drinking. A hundred litres a day is the equivalent of about 35 cubic meters per person a year.

Pakistan depends on irrigation and water resources for 90 percent of its food and crop production. Ninety six percent of the total available water is being used by the agriculture. One needs at least 3 litres of water to produce a tin of vegetables. To grow an adequate diet for a human being for a year requires about 300 tons of water-nearly a ton a day. Water is thus a limiting factor and one essential requirement of all forms of food production. No water, no food. Currently, agriculture is the most important user of water in our country. However, as Pakistani society develops, water for human consumption and sanitation and for industrial development will also make substantial claims on this precious resource.

One needs 100 litres of water to produce one kilogram of paper, 4500 litres to produce one ton of cement, 4.3 tons to manufacture one ton of steel, 50 tons to manufacture a ton of leather and no less than 2700 tons to make a ton of worsted suiting. The industry will be in need of large amount of water to produce enough for the local and external markets.

Domestic use is small as compared to industrial use and it is almost negligible in comparison to volume used for irrigation. Even this negligible amount is not available to a sizeable population and if available its quality can not be ensured due to pollution caused by the agricultural run-offs, discharge of untreated industrial and municipal effluents in the fresh water bodies and ground water contamination.

2. Role of Women as Water Carriers, Managers, Users and Health Educators:

Sixty eight percent people of Pakistan live in the rural areas. **Out** of which only 69% have access to safe drinking water, 30% of this population have to bring water from outside the household (Multiple Indicator Cluster Survey of Pakistan, 1995). An even smaller percentage of the rural population, only 8% had access to flush latrines with water borne sewage system.

Agriculture is the backbone of our national economy and rural population provide the most important production factor for this sector that is labour force. It employs nearly 52 percent of total labour force and women constitute almost 73 percent of this agricultural labour force if all those who are working on part time basis are also counted. So, quality water availability and its application in the sector will have direct impact on the lives and livelihoods of the women, which will ultimately have its impact on the economic development of the country.

Changed land use, water availability and application and its drainage to the nearest water body effect not only the very lives but also the livelihoods of millions of people, specially the women. They are depending on water one way or other upstream and downstream to fulfill the household needs as well as to provide meaningful economic activity for the survival of the household itself. They are working in the close proximity of nature, i.e. land and water. They know that once these crucial resources are adversely affected it will be very difficult to reverse

the process. Despite the fact that the women take an active part in basic agriculture and fish production, too often irrigation or other water development projects do not take into account women as participants in the development process. As they have very little legal claim to own these natural resources, i.e. land and water, and consequently rarely consulted.

For women in rural areas who manage water supplies especially for domestic use, the availability of water is of vital importance to their daily tasks. Sometimes they have to spend up to four hours to fetch it. as they do not have vehicles to carry it so they must transport the water on their heads. Carrying and fetching water for the household needs is considered one of the primary responsibility of the females of the household.

Water is needed for many purposes in the household-sanitation and waste disposal, child care, vegetable growing and food processing. Women not only collect it for domestic purposes but also sometimes for the economic use. More often women have to decide:

- Where to collect, how to draw, transport and store it.
- How many water sources can be used and depending on their quality for various purposes- for drinking. washing and in the kitchen; and
- How to purify drinking water using simple techniques such as filtration or materials available from their immediate environment.

The importance of water quality for health is clear. Most human diseases are transmitted by water. To avoid it women usually take a great interest in health care. They are the ones who use water for proper waste disposal; they look after personal hygiene and take responsibility for the cleaning of latrines, the washing of clothes and dishes and house cleaning. Because all of these tasks require water women have establish ways of reusing water to conserve supplies.

Over centuries, women have acquired extensive knowledge about water: its sources, its qualities, its uses and conservation. This knowledge is passed on both within the families, to daughters and granddaughters; and to other women, for women continually exchange information on these subjects at their meeting places -often the water source itself. Drawing on this knowledge, women often create their own effective primary health-care networks.

Any effort to improve local water supplies must take account of these related issues. Not only women need sources close at hand to save them valuable time in collection, but water points must continue to play their part as informal meeting places, where women can exchange information and learn from each other.

3. Causes of Water Shortage and Water Pollution in Pakistan:

While it has been established that water is a finite source, we continue to use it inefficiently, even in the face of increased demands. This “Temperate Zone mentality” is inadvertently propagated by the dominance of scientists, engineers and policy makers from areas of sufficient rain-fall and water supply.

Northern engineers ask “How much water do we need and where do we get it?” rather than “How much water is there and how can we benefit from it in a sustainable manner?” This climatic bias is passed down to indigenous engineers and scientists through Northern training, encouraging inefficient practices and further waste of precious water resources. The vast irrigation system of Pakistan is comprised of three major storage reservoirs, 19 barrages or head works, 43 main canals with conveyance length of 57,000 kilometers and 89,000 water courses with a running length of more than *1.65* million kilometers. This vast irrigation system

feeds more than 40 million acres of irrigated land in Pakistan, a country with the highest irrigated and rain-fed land ratio in the world, 4:1.

Diversion of Waterways:
This impressive irrigation and water resource development has not been without environmental and resource degradation costs in all the ecosystems, i.e., mountains, planis and in the delta and coastal areas. According to Arif Hassan. two dams at Terbella and Chashma reservoirs resulted in diverting the 74 percent of Indus waters before reaching Kotri. As far as ecological aspects are concerned the shortage of water for out flow to sea. which is currently 5MAF according to WAPDA, has already caused reduction in the volume of silt, a pre-requisite for delta formation. Indus River once brought down 600 million tones o silt, out of which half reached the sea and half fertilized the alluvial plain. Today most of it is trapped in the upstream water storage
reservoirs and very little is left to be spread over the plains and to form delta. As a result of it Indus delta has reduced from 350 sq. kilometer before independence with 9 perennial streams to just 25 sq. km with only two perennial streams, with elimination of riverine forests and destruction of mangrove forests. Various distinct fish varieties have become extinct with a reduction in annual Palla production from 5000 tons to just 500 tons.

Inefficient Irrigation Systems:
On one hand, diversion of water for the irrigation purposes is playing havoc with ecosystems in upstream and downstream and on the other hand that much needed water resource is subjected to inefficient use and wasted due to poor management. According to NCS sector paper on water prepared by the IUCN out of total 146.6 MAF freshwater (104.82 MAF canal withdrawals and 43.8 MAF groundwater) inefficient irrigation system losses are nearly 73 MAF due to unlined canals, watercourses and ditches, poor maintenance of these water courses and because of flood irrigation methods and poorly leveled fields.

Water logging and Salinity:
During the design and planning of irrigation systems drainage schemes should have been built in. A failure to do so has contributed to a rise in the water table that along with the seepage from the irrigation system has proved detrimental to the agro-economic structure of the country. Together with the controlled irrigation and increased diversions it resulted in the rapid onslaught of the twin problems of water logging and salinity. According to WAPDA 12.9 percent of the greater canal area had a subsurface water table between 0 to 1.5 meters and had been declared a disaster area (Pakistan National Conservation Strategy, 1992). Just as it accounts for the greatest water use, agriculture also accounts for the most waste. Worldwide only 37 percent irrigation water contributes to the growth of crops; the other 63 percent is wasted and this over watering results in water logged fields and reduced crop production.

Groundwater Depletion and pollution:
Intense usage pressure severely damages water resources. Aquifer depletion, lowered water tables and saltwater intrusion decrease the amount of available water suitable for human use. The growing water needs of the global population have led to greater exploitation of groundwater. Prior to canal irrigation, groundwater was found at shallow depths alongside rivers and streams; its depth below surface increased with the distance from the recharge source. In 1958 WAPDA adopted tubewell drainage to combat waterlogging and salinity in non-saline areas. The lands were reclaimed and the excess water used to supplement the canal supplies, which helped to increase cropping intensity.

This was so popular among the farmers that the number of private tubewells increased the

public ones and groundwater being pumped annually for irrigation and drainage. About 70 percent of these tubewells are located in the canal commands. Groundwater pumpage in the Indus planis increased from 3.34 MAF in 1959-60 to 43.8MAF in 1990-91.
Intensified demand in certain areas of Pakistan has led to " Water mining" in which water is withdrawn from an aquifer much faster than it can be replenished. The results include lowered water tables such as in Quetta valley and Lahore cities, increased pumping costs and saltwater intrusion due to the drainage practices extension in the saline zones. Large scale withdrawal of groundwater is creating differential heads, and may result in the lateral and vertical movement of saline water into freshwater zones.

Water quality is severely affected by rapidly increasing population, its increasing demands for food and energy which results in deforestation, increased agriculture, urbanization and industrilization.

Deforestation:
Pakistan does not have large forest cover and due to the high consumption patterns and population stress, the deforestation is also on increase to produce more food and wood for construction. It has adverse effects on hydrological cycle. It disturbs soil permeability which can result in increase in runoff and erosion, flooding, less groundwater recharge. These consequences can be devastating for those people, who live in heavily farmed alluvial Indus basin and valleys that depend on forested mountain watershed for their water.

urbanization:
According to 1998 census rapid urbanization is on rise resulting in mega-cities, the resulting impact are widespread and considerable, directly affecting the well being of urban dwellers, including inadequate and poor quality of water supplies, poor sanitation and hygiene. In addition, urban services have seriously lagged behind the growth and the deficiencies in water supplies, sewerage and solid waste collection and disposal is prevalent in all urban areas. Furthermore, virtually all urban sewage (domestic and industrial effluents) is discharged untreated in the nearby hinterland to irrigate agriculture land or to the country's rivers, which bear the brunt liquid pollution particularly under low flow conditions, resulting in impairment of water resources, fish kills and other ecological damage.

Agricultural Runoffi
Pakistan is one of those countries, whose irrigated land comprises only 17 percent of all cropland and rely on irrigated land for over half of domestic food production. Production on existing cropland is increased by hybrid seeds, irrigation and with the use of fertilizers and pesticides. Farmers are cultivating higher slopes without taking time to prepare terraces. The result is increased flush flooding and poor groundwater recharge, decreasing water supplies. Soil erosion from agricultural land causes severe sedimentation and pressure of fertilizers and pesticides causes heavy demand on oxygen resulting in eutrophication of streams. This agricultural runoff has caused decreased fish production or wiping of various aquatic life forms altogether resulting in unemployment of thousands of people. The costs of these off farm damages may exceed the benefits of on-farm gains in crop production.
Water applied in excess of crop's requirement can migrate to groundwater, carrying salts and other pollutants with it causing groundwater contamination. The presence of nitrogen and phosphorus causes eutrophication —which makes water turbid and effecting its quality as drinking water, its use for recreation and ability to support fish production.

Toxic Waste *Pollution:*
Despite the relatively low industralization in the country, most of the effluents has become a

serious threat to the quality of surface as well as groundwater. This toxic untreated wastewater discharged to the sewers or to the nearest water body to become a deadly cocktail. Breakdown of drainage or water supply system made it easier to pass on these deadly elements to the human being. Most of the diseases are water borne. The rivers and lakes passing by the city do not resemble freshwater bodies any more but more like untreated sewage and presence of any life form in such a water body is unthinkable. River Ravi, Kabul are just examples of this ill treatment.

4. Impact of Water shortage and Pollution on Women:

Increase in work load, health, problems, displacement, loss of control over resources and knowledge and limited economic opportunities are few of many problems women face as water resources are diverted, depleted or polluted.

Work burden:
As supply of unpolluted drinking water and the sanitary disposal of human wastes are fundamental to human health, lack of convenient water supplies puts great stress on families in our country, where it is the women and children who are mainly responsible for water carrying. Not only this is arduous, back breaking and repetitive work but it also occupies considerable portions of the day of women and children.

Though the women comprises almost 73 percent of the agricultural labour force but has limited access to land and water resources (water allocations are directly proportional to landholdings). As a result of this, they have very limited access to the decision making process regarding the land use or the application of water. So when market oriented agriculture (mono cropping) starts, they are pushed out of the near vicinity to look for their fuel and fodder, meaning more distance need to cover and more time allocation for this, leaving them with few hours and still a lot of work to do.

They are forced to spend more time and energy when onslaught of water logging and salinity or domestic and industrial effluents makes the water of the nearby wells, taps and streams undrinkable. If could not find unpolluted water supply then spending time to try to make it drinkable by using simple techniques

When the members of the household become sick due to the unsafe drinking water in the wells, taps or in the streams, their traditional role demands as caretaker of the family health to look after the sick ones in addition to their other duties.
When males of the family out migrate due to the un-profitability of the agriculture, degraded land, diminishing livelihoods in fishing communities due to decreased fish catch in low and polluted waters or are simply ill, women are forced to supplement family incomes by depending upon tedious work such as embroidery.

Health Problems:
In some of the water scarce areas some common health problems reported by the women were diarrhea, tuberculosis, hepatitis, still births, miscarriages, thyroid, skin and eye problems.

Women attributed much of their suffering to water. Poor quality of water, social expectations and workload also were reported to have severe implications on women's reproductive health.

Dwindling bio diversity on land and water due to the current agricultural practices, deforestation and diversion of water ways, discharged of untreated domestic and industrial wastewater left the

communities with very limited choice of food, which they previously had control on. Though the food is available in the market but with the unemployment on rise, the poor families who constitute more than 40 percent of the population can not access it. No clean water means no balanced food for the majority of the women in Pakistan.

When water scarcity is on increase, a little attention is paid to personal hygiene and sanitation needs, as it means to carry more load for longer distances. A Sindhi woman said that in her region woman only bathe three times in her life, i.e., when she is born, second at the time of her marriage and third at her funeral.

In urban slums most women depend on public water supplies. Poor city dwellers use public facility to bathe, but this is difficult for women where there is no privacy. Waste disposal is a major problem in densely populated areas without latrines. Many women suffer from waiting to find a suitable time and place for excretion. The often have to walk long distances to find a private site or they must attend their needs after dark, with all the personal safety risks that entails.

Loss of Control over Resources and Knowledge:
Women gather fruit, twigs, wild plant to make health potions from forests and variety of fish from streams, rivers and lakes. This is not only important for the food security and health of the household, crops and livestock but present an opportunity to learn from and about nature, which pass on to the next generations. Only a negligible amount of these women have any legal claim on the land. So, nobody consult women when change in its use is planned without taking into account of the loss of the knowledge and resources (raw material for medicines and food items) and its economic implication for the communities as a whole. The women are considered consumers and dependent rather than the user and managers of the natural resources. The women's role and natural ability is not recognized as a result of which fewer programmes and schemes are planned to document this knowledge or to provide latest information or technology in this field.

Displacement:
Migration and resettlement caused by the construction of large dams, desertification and loss of livelihood in itself is a traumatic experience. When combined with the new social and climatic conditions, it leaves women with no other options but to confine to their cramped houses and with little opportunity for better education and employment. Disruption of family and low social status are few of many consequences these migrant face. All the refugees of Terbella dam are not compensated so far, though no compensation is enough for losing one's own niche.

Limited Econonzic Opportunities:
Agriculture is the prime user of the water supplies and employs 52 percent of total labour force. Out of which 73 percent are women and seventy percent of these women are farm labourers. When any field is adversely affected by the water logging or salinity or water body is degraded causing reduction in fish catch, these women find themselves out ofjob. With the deteriorating environment the work load of these women increases considerably along with the necessity to earn to supplement household income. The males of the household migrate but the social responsibility of the females make them practically immobile and they are left with limited economic choices and prone to exploitation and forced to work at low wages too.

Fifty five percent of drinking water is drawn from surface and 45 percent from the ground. Both these sources are affected by industrial and municipal pollution. Most of the diseases are caused by drinking this polluted water and to attend the sick ones the women can not leave their homes to pursue their jobs and careers as a result they are forced to accept some low wage job

for long hours to supplement the household incomes.

When they themselves suffer from the sickness caused by the polluted water, it leaves them weak. Because they lack stamina to work for long hours for long period of time, they find themselves out ofjob frequently.

The picture is not so bleak all over, there are some positive cases too where women have changed not only the health scenario of the households but also helped in healing the environment by conserving the water and land and help in gearing the economic development of the communities too.

5. A Success Story **from Northern Areas of Pakistan:**

The terrain of Northern Areas of Pakistan is very difficult it comprises of very high, dry mountains with very limited forest cover. The subsistence farming system is being replaced by commercial farming system. As a result of it the forest near the villages is being cleared to convert it into fields and usually mono copping is practiced.

The women are facing problems to collect fuel wood and fruit as they have to cover more distance and spend more time to perform these chores with the forest being pushed away. It also became difficult for them to collect plants for remedial measures from the far
away forest. The river is far and women have to spend hours to bring water for the daily use or to depend on the supplies, which are not very clean, causing ailments very frequently.

But in one village of Karimabad district of Gilgit the women group organized by Agha Khan Rural Support Programme, decided to do something to solve those problems they face on daily basis. i.e., collection of water, fuel and fruit for their daily consumption. There was a plot of land not in the use of the villagers and considered as waste-land. The women decided to ask the male of the village to give that plot of the land to the women group to use for the collective benefit. They negotiated and were finally able to get hold of that piece of land. Then they needed water to cultivate this piece of land and river was far, so they collectively work to make a watercourse to bring water from the river to the village. The land was used to plant fruit trees and trees to be used for the fuel wood. On the whole 10,400 trees for fuel and 8,700 fruit trees were planted. A small portion of the land was used to raise fruit trees nursery, which were sold to the neighbouring villages for extra income. In another small portion vegetables were sown successfully which not only supplemented their household food needs but also provided a source of income too. In the first year they make overall profit of twelve thousand rupees just from the vegetables sale.

On the whole the nutrition of the households in the village was improved with the inclusion of vegetables, fruits in their daily diets. As the source of fuel wood and water were brought nearby the women's time saved was invested to raise the fruit trees nursery and vegetables for the local market, which improved the income of the households. The water was the life-line of all this prosperity so it was very well maintained and unpolluted clean drinking water was at last made available to the village by some hardworking women.

6. **Conclusion:**

Pakistan is faced with a simple but daunting challenge: how to jump-start the economy in a manner which ensures its sustained growth while integrating gender and environmental issues in the national priority agenda. The policy makers and decision-makers should realize that the

women are victims of degraded environment and deteriorated quality of waters. So these women are most natural allies while formulating any policy and programme based on genuine participatory process allowing the civil society to play a major role in fashioning and implementing badly needed policies.

Most of the time these women can not play their role more effectively as they do not have any legal claim on these resources. So whenever there is any scheme to distribute the resources among the unprivileged classes the women should also be given priority to revert their historic disadvantageous position in the society and to play a major role in the regeneration of the environment.

Environment is not divided in sectors and development of any one factor will effect different sections of the society differently. So cost benefit analysis of any water
development project done on the basis ofjust one sector can not show the true picture ever. Therefore the Impact Analysis of any project on the whole system should be carried out and possibility to work on an alternative option should not be ruled out altogether. Nearly the entire spectrum of conservation and efficiency options cost less than the development of new water sources.

Following are some policy options to use water resources more efficiently:

1. Stop leakages in the distribution system and deliver water more efficiently by lining the irrigation channels.
2. Consumption tax on the over usage of water by affluent, i.e., life line rates for minimum requirements and high prices for luxury levels of consumption.
3. Encourage irrigation when crop need water rather than whenever water is available.
4. Research to determine how much water of what quality is needed to keep the ecosystems in good working order-which is critical to protect fisheries, delta economies and the health of the local people.
5. When compared water supply projects to measures to reduce the demand for water thorough investments in conservation, recycling and increased efficiency are typically the most economic alternatives of balancing water budgets.
6. Distribute the resumed state lands on the principal ofjoint ownership of land in the names of the males and the females of the households.
7. Water rights should be separated from the ownership of landholding and given to everybody equally with water trading right.

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