

1. Vision of the Integrated Water Resources Development in Afghanistan

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Overview

Afghanistan is a semi-arid land locked country located in the south central part of the Asia main land, lying within approximately 30 to 37 degrees North latitude and 61 to 72 degrees East longitude. It has an area of about 655,000 square km, and extends about 1,300 km from southwest to northeast, and about 600 km from northwest to southwest.

The interconnected ranges of the Pamirs, majestic Hindu Kush, Koh-i-Baba, and the Parapamisus that form a mountainous backbone are Afghanistan's dominant topographical feature (Fig. 1). These mountains rise in places to more than 6,000 meters, dividing the rich plains of the north from the central plateau and southern valleys and deserts. This impressive chain of mountains, and a smaller range running along the eastern edge of the country (Koh-i-Sulaiman), is the source of all the nation's rivers.

Landlocked and environmentally fragile, Afghanistan is a resilient yet shattered country struggling to put itself back together. Two decades of conflict, bombardments, years of severe drought, and the displacement of millions of people have been exacerbated by the country's high illiteracy, low life expectancy and grinding poverty. Although most of the hostilities have ceased and transitional government has replaced the Taliban regime, Afghanistan is unable to help itself without the infusion of massive foreign aid.



Fig.1 Afghanistan's dominant topographical feature

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Afghanistan's urban environment is in a dismal state. Lack of clean water and sanitary/sewage facilities, overcrowding and air pollution have led to urban decay, worsened by the physical damage caused by years of bombing and hostilities. The current environment of Afghanistan is rapidly changing with contradictory trends. The population is moving in many areas due to returning refugees and displaced persons.

Agriculture production is the mainstay of the livelihood of rural communities in Afghanistan and is largely dependent on water supply from traditional surface and underground irrigation systems. Four years of continuous worst ever drought and the dry climate of the country have proved that without water security there will not be food security in the country. During the drought period, due to the shortage of water in the streams and very low amount of rainfall in the rain fed areas and pastures, the cereal yields in Afghanistan had declined by 20 percent in the irrigated areas, by 80 percent in the rain fed areas and dramatic consequences on fodder production. Also the amount of drinking water provided by the canals, karezes, springs and wells has reduced significantly.

Beside the recent drought, the traditional surface and underground irrigation/water supply systems, rain fed areas and pastures have suffered extensive damage and destruction by direct and indirect impact of the war. Their rehabilitation is beyond the present capacity of the communities. Emergency rehabilitation of traditional irrigation systems and securing water supply are thus required to restore agriculture production and drinking water, to assist Afghan returnees in resuming a self-supporting life and to encourage the internally displaced people and refugees to return to their home villages.

With the emergence of the new government, political stability and security in Afghanistan has been improved and allowed deploying again supports for the rehabilitation of the food production capacities and provision of drinking water in the country. With the return of displaced families, the pressure on the land and water resources will increase and the sufficient supply of water to the communities' remains the major factor.

As a result of conflict and drought, the massive population movement for survival caused sever depletion of natural resources coupled with lack of environmental management severely degraded the environment. The country is currently initiating development steps to sound environmental management, conservation and regeneration programs and activities.

Both national capacity to deliver and involvement of the women have been constrained by the years of conflict. To enable the Afghans to be in the driver's seat, immediate and massive capacity building primarily involving the younger generation and women is imperative. Women that conservatively make up 50% of the population are also at a disadvantageous position and require immediate attention so that they play their rightful role in the society.

Some of the proposed project profiles are intended to redress the damages briefly mentioned above by improving food security in the country by providing quality seed and fertilizer and other inputs, raising the capacity of the national crop sector through the setting and upholding high agronomic standard for crop production, rehabilitating and developing irrigation systems, increasing and advancing live stock production, providing potable water, preserving and regenerating natural resources and the environment, and more importantly by building national capacity and ownership.

Climate

The climate of the country is continental in the nature, with cold winters and hot summers. Most of the country is semi-arid or arid, with low amounts of precipitation and high or very high variability between years. Snowfall is concentrated in the central mountains and the higher ranges of the northeast. Winter temperature is low in both these areas, below 15°C for many weeks during winter. Most of Afghanistan is influenced by weather fronts from the Mediterranean, with low and erratic rainfall, typically in spring. The east of the country lies near the margin of the monsoon system affecting the Indian subcontinent. Some part of this area has up to 1200 mm of rainfall in summer (roughly five times the national average).

Hydrology

The hydrological system of the country is comprised of ten river systems flowing in the five basins of the Oxus or Amu Daya (North and North East Basins), Helmand, Kabul (Indus) and Harirud. (Fig.2). The river systems are characterized by fairly steep gradients in all but the lower reaches and by transport of large silt loads during heavy runoff from rain and snow melt.

Today the information on water sources and irrigation and water supply systems in most parts of the country date back up to more than two decades. The lack of actual baseline figures makes the adequate planning of projects a hazardous exercise.



Fig.2 Afghanistan main river basins map

Land Resources

Total agricultural land in Afghanistan is 7.4 million ha which out of this 5.3 million ha is usable, but only 2.6 to 2.8 million ha can be irrigated annually by formal and traditional irrigation systems. About 3 million ha is under rain fed agricultural land (dry farming).

Most of the population of the country depends on local agriculture. And with its arid and semiarid continental climate, agriculture depends on irrigation. Water is not the only constraint to production, but it is one of the most important. This is evident to the farmers and is reflected in land prices. Irrigated plots may cost 100 times more than non-irrigated ones. Although there were many problems relating to irrigation practices before the war, hostilities and war have added many more. More than two decades of unrest has caused irrigation systems to suffer both from direct damage and from lack of maintenance.

Water Resources and its Problems

For most of human history, water has been seen as an inexhaustible resource. Afghanistan is the source of great amount of fresh water, but unfortunately is using a limited amount. However management of water resources has not been effective during the long period of conflicts in Afghanistan, and even long before that due to geopolitical situation in the country. That is why efficient use and proper management of the water resources in Afghanistan which also secures water for the downstream countries is essential for the reconstruction of Afghanistan, Water issues are the most important aspect of the design of the reconstruction of Afghanistan. In order to develop the infrastructure it is necessary to secure a sustainable water resources development, and a new funding mechanism must be established. A comprehensive review of water resources on a regional basis is urgently needed. This would continue both to long- term planning and identifying short- term crises where rapid intervention is required. The capacity of the Ministry of Irrigation, Water Resources and Environment to plan and implement water resources management is weak. Rebuilding this capacity and providing it with resources to function properly will be a key element in the management of Afghan water resources. This must include (i) re- establishing a national hydrological and meteorological network; and (ii) the development of the watershed management plans

One of the main sources of water in Afghanistan is Amu River. Water flows from 35% of the land of Afghanistan to this river, but Afghanistan due to the mentioned problems couldn't use water from this source for the agricultural development of the nation. Integrated water resources management for the whole basin and the sustainable development of the entire region are absolutely necessary. We are aware of the present condition of the Aral Sea, that is why an integrated water resources management involving both the upper and lower reaches must be incorporated in to the reconstruction of Afghanistan and now we have an excellent opportunity to give consideration to this issue.

Irrigation Problems and Constraints

Irrigated agriculture involves many components that begin with catchments. In Afghanistan the problems starts here. Due to deforestation of the catchments, erosion has increased, surface soils have been washed away and silt loads in the rivers have increased, causing serious problems for the conveyance canals and other hydraulic structure in the systems.

Resource inventory and lack of data collection is one of the biggest problems. Stream flows, for example, have not been measured for last 24 years, since all gauging stations are damaged or destroyed. Similarly data on the ground water level inventory is scanty. Although a limited and very general soil reconnaissance was made in early 1960s, a comprehensive inventory of soil productivity and soil fertility has probably never been made in Afghanistan. An adequate land classification is needed. Some studies had started before the conflict, and some laboratories were established, but every thing is destroyed.

The technology employed for water conveyance in Afghanistan is primitive. Local organizations for system operation and maintenance exist at the community level (Mirab or water master); however the structure and effectiveness of such organization depends on the size of the individual system. With proper hydraulic design, small-scale irrigation systems would be much easier to operate and maintain. In traditional irrigation systems there is little control of the amount of water entering in to the canal and protection from flood damage is minimal. The conveyance system is subject to many losses. The causes of the loss vary and include the following:

- Seepage through the pervious soils in which the conveyance system is excavated.
- Inadequate hydraulic shape of the conveyance system through over sizing of the conveyance channels, which increase seepage and cause excessive excavation.
- Weak banks, washes, galleys truck crossings are major loss points in many conveyance canals, causing farmers to spend much time in maintenance and repairs.
- Aquatic growth within the conveyance system often impedes the normal irrigation flows, and may contribute to evapotranspiration losses.

Lack of water management through the delivery system up to the farm, and on farm water management is another constraint.

Natural Resources Management Program

The National Development Framework (NDF) is a national plan covering the full range of social and economic activity in the redevelopment of Afghanistan. It is set on three pillars; (i) Humanitarian and Human and Social Capital; (ii) Physical Reconstruction and Natural Resources Management; and (iii) Private Sector Development. In the National Development Framework (NDF) of the transitional Islamic State of Afghanistan, the Natural Resources Management Program is one of the priorities and it embraces agriculture, livestock, water resources and irrigation pastorals, forestry and environment.

The Natural Resources Management Program's goal is to assist the country to become a food secure and self-reliant nation. It is also to assist the country to provide potable water to the entire population as well as to preserve the environment as a whole.

The above stated goals could be achieved by; (i) developing national capacity and ownership creating programs; (ii) promoting food security and nutrition; (iii) engaging in sustainable management of natural resources; (iv) preserving and regenerating the environment; (v) promoting sustainable agriculture and rural development; (vi) enhancing economic development; (vii) upgrading skills and knowledge; and (viii) creating employment.

Vision and Direction for the Integrated Water Resources Development

Water resources are better understood using a river basin framework. As it was mentioned, Afghanistan can be divided into five river basins based on drainage patterns. Using basins as the unit of analysis, provinces in the northeastern basins have a surplus of water while those in the northwestern, western, central and southwestern are quite short of water.

Nearly 85% of all irrigation systems in Afghanistan, covering about 2.3 million ha, are traditional schemes developed and built by farmers and operated and maintained by them according to traditional communal customs and practices.

The major thrust of the Ministry of Irrigation, Water Resources and Environment in the investments over the next 3 years are;

- Institutional development program of MIWRE
- River basin development and monitoring
- Emergency small scale rehabilitation of some 1.5 million ha
- Emergency medium and large scale rehabilitation of some 954,000 ha
- Feasibility studies and completion of ongoing dam construction

For better management and development of natural resources, the plan is that more Afghans acquire more expertise in their respective areas. The strategic goal is to assist Afghanistan to become a self-reliant nation. To reach this goal we need to follow these steps:

Institutional strengthening / capacity building

- To enhance the capacity of the government in policy and strategy formulation, planning, programming and implementation for the agricultural and rural sector.
- Improved capacity of the government and local communities to manage water resources and irrigation systems by trained staff at the Ministry of Irrigation, Water Resources and Environment able to provide services and technical advice.

Water Resources Management

- Rehabilitation of national hydro-meteorological observation network
- Irrigation systems rehabilitation for the benefit of the communities and particularly settlements with a high concentration of returnees.
- Update and undertake extra feasibility studies for long term water resources projects.
- Construction of small, medium and large multi purpose storage dams and reservoirs to eliminate the shortage of water for drought years.
- Development of an integrated water resources management system

Environment preservation and regeneration

- To train staff in environmental aspects, establish environmental institutions and policies, increase environmental information flows, increase inter-ministerial collaboration on the environment, increase access to international funding mechanism and increase environmental education.
- Strengthen the MIWRE to deal with the national priorities for environmental management and protection.

Summary

VISION OF THE INTEGRATED WATER RESOURCES DEVELOPMENT IN AFGHANISTAN

Afghanistan is a semi-arid land locked country located in the south central part of the Asia main land. Two decades of conflict, bombardments, years of severe drought, and the displacement of millions of people have been exacerbated by the country's high illiteracy, low life expectancy and grinding poverty. Afghanistan's urban environment is in a dismal state.

Agriculture production is the mainstay of the livelihood of rural communities in Afghanistan and is largely dependent on water supply from traditional surface and underground irrigation systems.

Nearly 85% of all irrigation systems in Afghanistan, covering about 3.2 million ha, are traditional schemes developed and built by farmers and operated and maintained by them according to traditional communal customs and practices.

The country is currently initiating development steps to sound environmental management, conservation and regeneration programs and activities. The country can overcome the damages by improving food security in the country by:

- Providing quality seed and fertilizer and other inputs,
- Raising the capacity of the national crop sector through the setting and upholding high agronomic standard for crop production,
- Rehabilitating and developing irrigation systems,
- Development of an integrated water resources management system,
- Increasing and advancing live stock production,
- Providing potable water,
- Preserving and regenerating natural resources and the environment,
- And more importantly by building national capacity and ownership.