

Current Situation and Problems of Afghanistan Water Resources

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1. Introduction:

Afghanistan is a landlocked country of about 65 million hectares and 29 million people, of which 16.5 million people live in rural areas. It is characterized by a rugged mountainous landscape, and scattered human settlements. The economy of the country is based on agricultural products and livestock. Majority of the rural population is small subsistence farmers who live on small plots of land. Therefore, water resources studying is a vital factor for the economic growth and to meet the people's needs for food and fiber. Annual precipitation is from 200mm to 600mm and more than 50% of the country receiving less than 300mm of precipitation. There is permanent snow and glaciers above 5,000 meter. (FAO, Food and Agriculture Organization, 1996) but there is not much research and study on it to have the actual and accurate data. The biggest challenge for Water Resources Engineers is the lack of data. A combination of war, civil conflict, exploitation and enforced neglect have combined to leave a legacy of degraded natural resources including agriculture, especially destroyed infrastructure and fragmented rural institutions. In this paper, we examine the current situation and problems of Afghanistan water resources based on several available literatures..

2. Geographical outline of Afghanistan

Afghanistan is located between 29°35'–38°40' latitude and 60°31'–74°55' of longitude. As shown in Fig.1 Afghanistan is bounded by Turkmenistan, Uzbekistan and Tajikistan in the North, China to the Northeast, Pakistan to the East and South and Iran to the West. Afghanistan is characterized by its rugged mountains with snow-covered peaks of high altitude, up to 7500 meters above sea level (m asl), fertile valleys



Fig.1: Location map of Afghanistan

and desert plains. From topographical point of view the country can be divided into three groups. Low lands with 300-500 m asl, medium land with 500-2000 m asl and high land between 2000-7500 m asl. About half of the country has an altitude of more than 2000 m asl. Lowlands include river valleys and desert regions are located in the northern, western, southwestern and southeastern parts while high lands are generally located in the central part of the country.

3. River Basins:

Hydrologically Afghanistan is divided into 5 major river basins and none drainage area as shown in Fig.2.

River Basin I – Kabul/ Indus River

River Basin II – Helmand River Basin

River Basin III – Western Rivers Basin

River Basin IV – Northern Rivers Basin

River Basin V – Northeastern Rivers Basin

The largest and the most important river basin in Afghanistan is the River Basin II- Helmand River Basin because of 262,341 km² of area and covers 43 percent of the total national territory.

4. Surface Water Resources:

Although Afghanistan is located in semi-arid area it is still rich in water resources mainly due to the series of high mountains such as Wakhan, Hindu Kush and Baba covered by snow. Natural storage of water in the form of snow during winter supports perennial flow in all major rivers by snow melt during summer. Fig.3 shows monthly inflow discharge of the Kabul river in 1979.

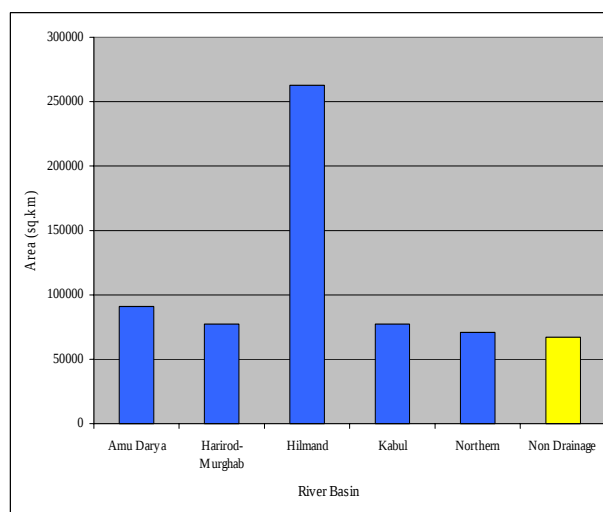


Fig. 2: Area (sq.km) of each river basin

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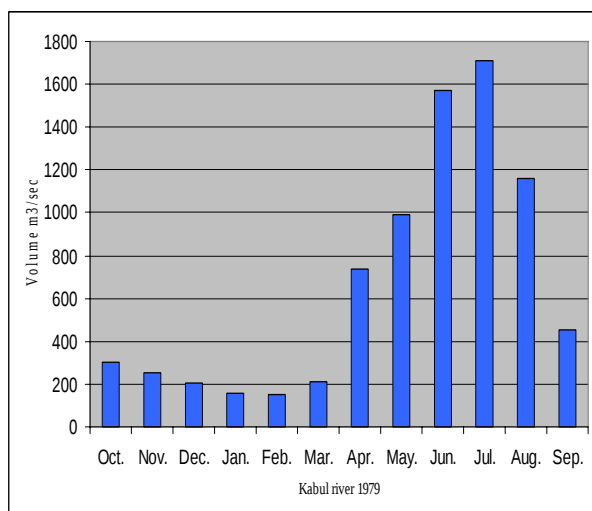


Fig. 3: Kabul river discharge during the year of 1979

. The mountainous are almost at elevations above 2,000 m asl represents 80 percent of Afghanistan's water resources (excluding fossil groundwater). The amount of water received in these areas through precipitation is estimated to be in the order of 150,000 million m³. The rest of the country receives only 30,000 million m³ annually through rainfall, resulting in a total of 180,000 million m³ for the whole country (FAO, 1996). The total annual surface water volume is 84,000 million m³.

5. Groundwater Resources:

Afghanistan possesses huge reserves of groundwater. According to FAO (1996) estimation the annual potential amount of groundwater in the country is about 20 billion cubic meters (BCM). At present, only 3 BCM is being used and in the next 10 years it will increase to 8 BCM due to irrigation and domestic water supply requirements. More than 15% of Afghanistan's irrigated land gets water from traditional underground systems such as Karezes (Qanats), springs and shallow wells (locally called as Arhads). Karezes are underground systems, which tap groundwater by gravity from the aquifer to provide water for irrigating crops and domestic purposes.

6. Lack of Data & Water Resources Management

The two and half decades of armed conflict started by Russian invasion have imposed numerous negative environmental impacts in Afghanistan. All basement of meteorological stations were destroyed and there is no hydrometeorological data for the last 25 years period started from 1978 to 2002. Before 1980, there were about 18 well-equipped meteorological and hydrological stations working across Afghanistan. These stations were the main source of data for the planning and operation of water resources systems. All these stations have been completely destroyed during the years of war and conflict and presently no information is being collected for the analysis of present situation and future projections of the water.

7. New Research for Old Data

A number of national and International organizations are presently engaged in the assessment of current situation and strategy development for short, medium and long-term projects for the rehabilitation of reservoir dam, meteorological stations and irrigation systems after establishment of new government in 2002. We were looking to find the availability of actual hydrological data relating water resources for new research which was read from the installed stations inside the country. We found the 25 years old meteorology data from 1974 - 1984 but these are obviously not up-to-date data. Therefore our new works for old data were to change the data and make a complete data base in digital format because 25 years before there was not computer in Afghanistan to enter the data to computer. It was the best step for new researcher and future project of hydrology.

8. Conclusions:

The water issue is becoming a serious problem, and the last four years of drought added another big issue to Afghanistan. For the formulation of strategy for the rehabilitation of irrigation systems and water resource management, a comprehensive database and information systems should be established. This is absolutely necessary for the accurate and up to date assessment. The problems of water resources management in Afghanistan are complex and a straightforward solution seems impossible. In order to increase agricultural production and sustainability of irrigated agriculture, the overall strategy is necessary to increase water capital and make better use of water. Government must take the lead to make the coordination mechanism in place and provide effective oversight for quick recovery of water-related governmental sector, increase in crop production, improvement in water use efficiency and environmental sustainability. An enormous amount of technical expertise has been lost in the water sector over the past 25 years. This loss of human capital should be replaced as quickly as possible for the sector to recover its former status, reduce dependency on external expertise and enable citizens to develop their potential. Therefore a strategy should be developed to create training opportunities for farmers, quality sector managers and technical staff.

For water conservation and enhancement of groundwater recharge, construction of water management infrastructures such as check dams and rain harvesting structures are necessary.

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