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WATER RELATED PROBLEMS IN AFGHANISTAN

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ABSTRACT

Following three decades (before the Bonn conference) political unrest and civil war, Afghanistan faces many different environmental problems; mainly water is a serious problem nationwide. Because of Afghanistan's innate landlocked country, virtually all major Afghanistan's rivers drain off into riparian neighboring countries. According to the UNEP post-conflict environment Assessment report on Afghanistan, where as the country as a whole uses less than one-third of its water potential 75000 million cubic meters. Due to water scarcity, damaged water infrastructure systems during long time civil war in urban and rural areas water is a major and important problem. Meanwhile Afghanistan's water potentials are an equal distributed. Afghanistan will not reach its energy, irrigation (agriculture) or urban and rural development goals, without substantial improvement in the development and management of Afghanistan's water resources. These goals are have crucial relation to the Afghanistan National Development Strategy (ANDS, 2008-2013). As a result of drought in recent years (1999-2003) in Afghanistan degraded widespread natural resources: lowered water tables, dried up wetlands, eroded land, depleted wildlife populations and denuded forests. Excessive extraction of water for agriculture proposes combined with long term drought has led to drastic declines in water resources and absolutely Afghanistan's Environment is under the great pressures.

Keywords: Water Resources, drought, post-conflict, landlocked, rural area, water conflict, sanitation, water scarcity.

INTRODUCTION

Water is the major natural resource in Afghanistan. The National Development Frame Work (NDF) drafted by the Government of Afghanistan considers that "river basin management is the best instrument for dealing with the management of water resources" (W. Atlas of Afghanistan 2004). Afghanistan as a landlocked country has 652000 sq.km. About 82 % of Afghanistan's total land are rangeland and bare land, less than 2 % covers by forests and about 10 % of the territory is arable. One quarter of the Afghan territory lies above 2500 meters of the sea level. Rain and snow falls are the main source of river flows in Afghanistan. High altitudes of the Pamir and Hindukush are the original potential for several river basins in Afghanistan. Water flow in Afghanistan divided on five river basins:

1. The Amu Darya river basin
2. The Helmand river basin

3. The Kabul (Indus) river basin
4. The Harirod -Morghab river basin.
5. The Northern river basin(Blind river system).

According to the origin of the irrigation water, Government of Afghanistan has divided irrigation water into four classes, they are:

River and Streams, 84.6%

Springs, 7.9%

Karezes(kanats), 7%

Shallow and deep wells, 0.5%

Approximately all rivers in Afghanistan and most entire water supply of the country like water for drinking(potable water), irrigation, maintenance of wetland ecosystems (surface and ground water), are derived from falling of precipitation within the Afghanistan's own borders and the seasonal melting of snow and glaciers in highland areas. Unfortunately Afghanistan unable to have properly exploitation from its water potential. Lack of comprehensive strategy plan related to water issues, Integrated Water Resource Management (IWRM) is the considerable issues that Afghan Government indispensable to attended them.

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River Basins Map of Afghanistan

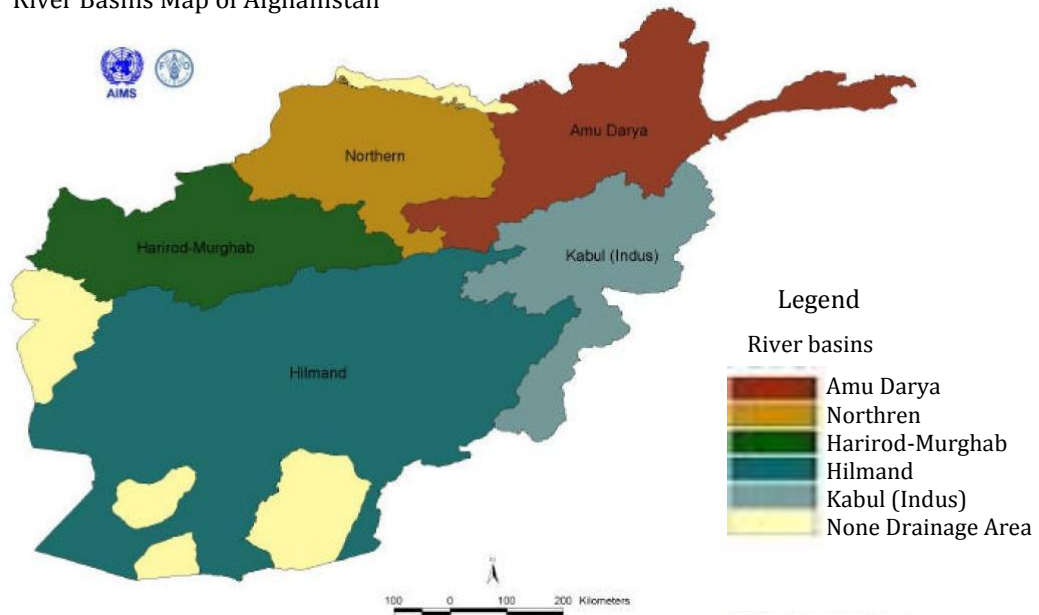


Figure 1. Map of river basin of Afghanistan.

Irrigation and Agriculture Sector: History of Irrigated agriculture in Afghanistan goes back to around 5000 year, as ancient settlement excavated near Kandahar province shows. More than 93 % of total water using in agriculture sector in Afghanistan. Approximately

Irrigated agriculture lands of Afghanistan concentrated in the southwest, west and northern part of the central high lands and mountains. Irrigated and rain feed area distribution by major river basins and type of water resources in Afghanistan shown in bellow tables.

Table 1. Agricultural Land by River Basin ('000 ha). World Bank Working Paper No.39 Jun 2004.

Type of Land	Amu Darya Basin	Kabul Basin	Helmand Basin	Total
Active Irrigated land	1155	450	1079	2681
Inactive Irrigated Land	211	99	410	720
Rain feed Agriculture Land	2428	9	197	2634

Table 2. Estimated Surface and Ground Water Resources (BCM/year) FAO, Water Resource Assessment 1996.

Type of Water Resources	Entire potential (bcm)	Present Situation		Potential Situation	
		Used	Unused	Future Use	Unused
Surface Water	57	17	40	30	27
Ground Water	18	3	15	5	13
Total	75	20	55	35	40

As shown in table (2), Afghanistan uses only 20 bcm from its whole country potential waters. In Afghanistan around 50 % of the GDP belongs to agriculture sector, crop production and animal husbandry are the basic fundament of Afghan's economy. Usually cropping concentrated in the valleys, where is available snow melt water that actually snow fall the main supply of Irrigation. One of the significant factor of scarcity water in recent three decade in Afghanistan was severe drought between 1999-2003 years. For example in 2001 number of Karezes (Type of Ground Water) were 6781,

but in 2003 quantity of Karezes decreased to 686. Actually this decline has serious impact in livelihood and Environment. Afghanistan has about 17 million hectare suitable lands for agriculture, of which 7.9 million hectare are arable prone including 5.3 million hectare suitable for Irrigation. Before the war were cultivated 4.5 million hectare, of which by the late 1970s crops were grown on 3829 thousand hectare. The ware and severe drought (1999-2003) damaged Afghanistan's agriculture enormously. After normalization of dilemma situation in Afghanistan

water consumption will be increased to 21-22 cubic km/year. If by 2020 whole lands suitable for irrigation in all country river basins of Afghanistan are put to irrigation (agriculture) use, then the total area reach to 2.2 million. Ministry of agriculture of Afghanistan in 1993 optimistically estimates that only 750000 ha were steel under satisfactory irrigation, but at the same time reconstructions have to be carried out in a context of scars human resources and no enough funds.

According to last five-year plan, Government earmarked 76 % of budget for irrigation works. As mentioned above the cultivated area has been at 8 million (7.9) hectare, which is 12 % of the hole Afghanistan's area. The cultivated area with annual crops 1991 was estimated at 3.2 million hectares which is only 82 % of

the area under cultivated in 1978. Additionally around 144000 hectares were estimated to consist of permanent crops in 1990.

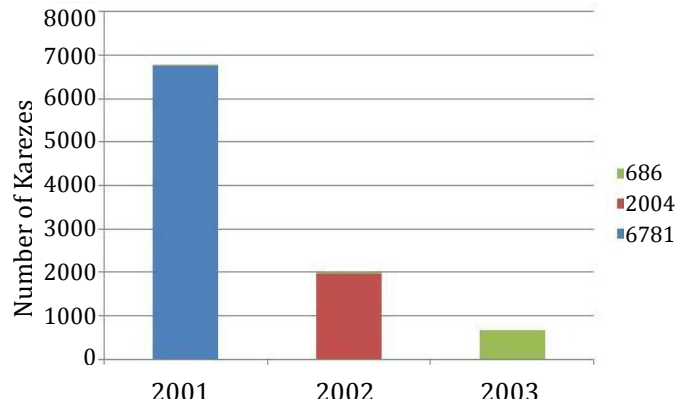


Figure 2. Decline of Karezes (kanats).

Table 3. Predicted Development of Irrigated Farming and Assumed water intake in the river basins of Afghanistan. (EastWest Institute. February 2010).

Basin	Predicted Development of Irrigated Farming Thousand hectares			Assumed Water Intake, Cu. km		
	1990	2000	2020	1990	2000	2020
Amu Darya	723	1250	1580	7.6	12.4	16.0
Helmand	800	400	500	3.0	4.0	5.0
Kabul(Indus)	110	146	146	1.1	1.5	1.5
Total	1633	1796	2246	11.7	17.9	22.5

According to the hydrographic system, the Afghanistan can be divided into four zones:

1. The southwestern basin with the Helmand rivers and its tributaries that following towards Sistan marshes (52%).
2. Amu Darya (northern) basin with its tributaries which drains toward the Aral Sea. In this basin includes a blind river system (10%) which disappears within Afghanistan (24 %).
3. The western region (12%) consisting of the Morghab and Harrirod basins.
4. The Kabul (Indus) basin (Eastern basin), which only the river system having outlet to the Sea, joining to the Indus river at attack in Pakistan (Previous border of Afghanistan with the Indian peninsula), 12%.

In 1987 from entire Afghanistan's water withdrawal was estimated at 26.11 km³/year, of which 99 % was Consumed for agricultural proposes. From almost 27 to 36 % of total irrigation system in Afghanistan directly were destroyed by civil war and lack of properly water management during recent three decades. Irrigated agricultural lands in Afghanistan

based on type of origination, divided into four classes, they are:

- Rivers (Surface Water), 84.6 %
- Springs (Ground Water), 7.9 %
- Karezes (Ground Water), 7.0 %
- Wheels (Shallow and Deep wheels), 0.5 %

Meanwhile in Afghanistan four main irrigation categories, they are:

Formal irrigation system: this system was established in the end of 1970s, they are Kunduz-Khanabad system in the north, Helmand Arghandab system in the south west and Ghaziabad complex forms vicinity Nangarhar province in the East.

- Large-Scale informal surface water system.
- Small-Scale informal surface water system. These systems are the traditional systems.
- Kareze irrigation system. Kareze supply waters one of the main types of potable water in Afghanistan.

Around 80 % of Afghanistan's population is engaged in agriculture, including livestock-rising. The most irrigated provinces are Balkh, Kunduz and jawzjan.

The least irrigated provinces are Laghman, Kunar and Bamiyan. (Afghanistan online. www.afghan-web.com).

Finally decreasing of Afghanistan's glaciers, long term civil war, political unrest, severe drought between 1999 to 2003 years, lack of proper management and water infrastructure in Afghanistan reduced and damaged irrigation systems in whole country.

Wetlands Turn to Dry: In Afghanistan wetlands ecosystem is created by rivers. Form 21 defined wetlands in Afghanistan three of them are international importance. There is widespread natural resource degradation including dried up wetlands. Now almost completely dried internationally significant Sistan Wetlands-Shared between Afghanistan and Iran countries. The drought has compounded problem caused by uncoordinated and properly management of the river basins, irrigation plan and dams. An efficient waters table resource affected much more on the natural vegetation of the Sistan wetland and dried vegetation collected for fuel. Annual average of Helmand and its main tributaries around 98 % declined bellow. Half of a million waterfowl including over than hundred species (150) were counted on Hamuni-puzak. two-thirds of which is in Afghanistan side whit eight globally threatened migratory birds like the Dalmatian Pelican and marbled teal were disappeared. Soil erosion and sand dune into settlements, agricultural area and onto roads are called the mean problems as a result of scarcity water potentials. According to the United

Nations Environmental Program (UNEP), assessment team in central part of Afghanistan were found the national waterfowl and flamingo sanctuaries at Abi-e-Estada and Dasht-e-Nawer were also completely disappeared. For example in 1986 year was seen the last Siberian crane in this area (UNEP 2002).

Safe and Fresh Water: Drinking safe and clean water is a basic human right. Lack of potable water affects sanitation, food supplies, health and economic development. Dirty water from industrial centers should be dumped in proper places in a safe way so that it doesn't pollute the ground clean water supplies. Only 13 % of afghan people have access to safe water (www.actionaid.org.uk). Both the civil and long term conflict and severe drought have played significant and comprehensive affects on damaging Karezes and shallow wheels in some provinces of Afghanistan like Kandahar and neighbor provinces because traditional Kareze system (Ground water supply) one of the main potable water resources for Afghan people. During the three recent decade years shallow water wheels and Karezes as a result of drought, conflicts and lack of water management system two-thirds of them were completely dried. Meanwhile lack of safe clean water created water-burn diseases such as dysentery and diarrhea. Lack of good sanitation and low awareness also contributes spread diseases impacts on food production. Irrigate crops also belongs to water scarcity.



Picture 1. Scarcity fresh water in Afghanistan.

Sanitation: To control the quality of drinking water is adopted to improve national health level by training require human resources for water, environmental security, laboratories research activities and waste water management. Establishment chemical and

bacteriological centers for analyzing of water supplies plays significant rule. Mainly the quality of water is polluted by domestic waste. Access to clean and sufficient drinking water needs improvement of waste water networks.

To approach existing standards are emphasized based on sustainable development principles. Main policies and strategies related to above objectives are:

Prevention and controlling water pollutants Coordinated properly management for waste water, water potentials and supporting healthy environment

- Making fundamental reforms through sound and coordinated methods.
- Increasing productivity of existing resources, Meanwhile facilities related to health services, Water distribution network, public education.
- Reduction of water usages, Setup appropriate technologies, necessary reforms and treating waste water.
- Giving information among people through necessary guide lines and distribution of sufficient awareness related water.
- Improving and development intersectoral collaboration.

Wastewater Problems: Migrations from rural to urban, industrial sector and increasing population growth have considerable affects on creating wastewater production. In low income countries like Afghanistan organization, industrialization, rapid population growth and unplanned informal activities one of the significant issues regard to wastewater and water pollution. Water and sanitation and poor management systems are the key problems. The majorities of households rely on water flush latrines and are connected to a chamber of pit for containment of excreta. In Afghanistan at present the produced waste rarely receive adequate treatment. Wastewater treatment including sanitation is an important environmental service that is closely depends to water management. There is an emerging problem deterioration of safe water quality from surface and ground water resources in Afghanistan. Unsafe potable water can be significant causes of diseases like Trachoma, Typhoid and cholera. Drinking water can also be tainted with Radiological, Physical and chemical contaminants with harmful impacts on human health. There are widespread sources of water contamination, they are untreated sewage, storm water drainage emptying or overflowing of septic tanks, seepage from pit latrines pollution by the waste from intensive livestock operations contamination by people's bathing, washing clothes in water resources ect. Form

the other side waste water generation closely depend to demand of water in everywhere.

One of the basic rights of human, its safe clean drinking water. In Afghanistan water which comes from wells and open streams more than 90% of which are contaminated to one degree are another.

As a result of very little sanitation services so animal and human waste runs again in to the streams for the downstream village to consume. Lack of proper sewage systems, polluted (dirty) and waste water industrial plants are the main problem because a lot of people suffer from contaminated and low quality (bad) water.

Flood Impacts: Floods in Afghanistan have increased significantly due to deforestation and vegetation losses, which decrease the water holding capacity of the lands. In Afghanistan some years as a result of flooding 1000 acres of farm lands destroyed. In June-July every year hundred hectares land in the riparian provinces of the northern part of Afghanistan destroyed by Amu Darya river because in the smelting snow and glacier season the Amu Darya river, water level increasing. From Kaldar and Shortepa districts people lose their houses, agricultural lands and animals.



Picture 2. Kaldar district of Balkh province Amu Darya River. (2010).

For possible mitigation of flood destructions, Government of Afghanistan indispensable to take prediction activities, but unfortunately as a result of no enough funds and financial problems against seasonal floods there are no attention and implementation. The recommended activities predict, control and manage floods, significant important consideration of flooding uses:

- Development and implementation of water and soil conservation measures.
- An early-warning system related to flood.

- Improving and development of flood management policy (like evacuation of people).
- Constriction of possible flood production activities.
- Make canal systems for divert flood streams.
- Assessment of feasibility to construct one or more dams for storage extra water during flood seasons.

TRANS BOUNDARY ISSUES

Agreements between Russia, Great Britain and Afghanistan: In January 11, 1843 signed in Sankt, Petersburg the first modern treaty related to the territory of Afghanistan. This treaty stipulated navigation condition and commerce on the Amu Darya. Then in October 17, 1872 and January 31, 1873 exchanged letters between Russia, Great Britain delimited the possession of territory belonging to the Amir of Kabul. This agreement established "That Badakhshan and Wakhan from lake Zar-Qul west along the Amu Darya to its junction with the Kokcha river formed part Afghanistan. The Amu Darya remained the northern boundary as far as the ferry at Khwaja Satar". (World Bank working paper 2004).

By protocol signed on August 18, 1926 the Urta-Togay Island was transferred to Afghanistan. Many relevant of the paper are the agreements concluded between previous Soviet Union and Afghanistan directly depend to water utilization by the Co-riparian of the Amu Darya basin. From those two are significant important agreements that allocate water use between the two sides.

The front year agreement between former Soviet Union and the Afghanistan Royal Government (June 31, 1946) and the second treaty between Afghanistan Royal Government and the Soviet Union Socialist Republics. According on June 1946 the parties set the Border between two sides, the mid-stream of Amu Darya River and its upstream part referred to as the Panje. This determines (assured) the right navigation of Afghanistan along these rivers. More data availability even now suggests that water use in Afghanistan is so much less than the existing water flows and drastic increase in the future highly.

Absolutely Afghanistan is the second-largest contributors of water resources to the Amu Darya River after Tajikistan; according to this important point is an obvious need for serious cooperation between Afghanistan and central Asian countries. Afghanistan's major infrastructure plans will create significant effects on water supplies in central Asia in the future.

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Helmand river basin (Agreement with Iran): In 1973 was signed bilateral treaty agreement between Iran and signed an agreement establishing. The Helmand river Delta commission between two Iran and Afghan States did not agree the 1951 provided report of commission.

In 1973 was signed bilateral treaty agreement between Iran and Afghanistan regard to allocation of the Helmand river's water resources. Twenty-Six cubic meters per second delimitate for Iran side according to this agreement. It's the only river that on which Afghanistan has interred into formal agreement with its western neighbor. Meanwhile Afghanistan and Iran recently have made constructive affords to cooperate on rehabilitation of Hamun lake. Two side tried in close cooperation since 2003 with the UNEP. The United Nations Environmental Program and the Global Environmental Facility (GEF) a trilateral sessions between, UNEP, Iran and Afghanistan. Certainly it's an integral part of a coordinated set of large, medium and small initiative addressing water management in the basins of the rivers that flowing into Sistan Swamp.

Kabul river (Eastern) basin: Including the main tributary Kunar River, the Kabul river basin one of the important available water resources in Afghanistan, Millions people using its water supplies for agriculture, drinking, sanitation, industries and Power generation. Kabul river basin water resources essentially shared between Pakistan and Afghanistan. Efforts in 2006 to provide new impetus to drafting process for a bilateral treaty under the World Bank consultation between two countries, but mediating role of world Bank did not gave optimal results. Meeting of the economic cooperation organization, Afghan, Tajik and Iran leaders in March 2009 agreed to speed up implementation of projects related to Water-Energy nexus. Joint commitments of a similar nature were not made between Pakistan and Afghanistan. (Este West institute 2010).

Third Regional Economic Cooperation Conference on Afghanistan (RECCA) in May 2009 was the most important ambitions joint statement by two countries, after Islamabad declaration.

Many donors are giving considerable attention to sustainable development of Afghanistan's water sector. Key donors for water sector are region states such as China, India Iran, as well as remote countries like Denmark, Germany, Norway, Sweden, Japan, Canada, United State of America, The United Kingdom, International organizations, like ADB, World Bank, European Commission, Islamic Development Bank (IDB), International NGOS are also plying significant role.

CONCLUSIONS

Access to clean drinking water is a first basic human right. There are several factors that influencing on domestic water use in society, like agricultural activities ,increasing population, types of water supplies, embedded technology in water management sector, quality of sanitation activities, storage of raw water in dry season, quality of canalization network, etc.

Clean potable water such as basic life necessity from the following sources is considerable safe:

Indented wells, protected dug wells (safe springs), bottled water, rain water collection, pipe into dwelling etc. Relevance to population growth and decreasing agricultural lands, the responsible authorities indispensable to consider the following points:

- Prevention of water losing in agricultural sector and urban water system network.
- Changing the consumption patterns.
- Regulated plans for drought combating.

- Remedial actions and renovation of water resources network.
- Recycling and treatment of used and waste water.
- Prevention of water aquifer depletion.

Uncontrolled population growth and drought could increase the problems of water scarcity and shortage of fresh water supplies.

RECOMMENDATION

Stakeholders of the water field must be carefully, against to the following issues:

- The Poor drought combating at national level
- The Lack of economic consideration for water
- The Uncontrolled usage of water
- The Pollution of ground water and open water (rivers) resources in the area
- The Pollution of water supplies used in agricultural sector due to the variety of sewage disposals from agricultural and industrial and urban water network
- The Trans boundary river basins tensions and conflicts in international level
- The Limited fund resources for water supplies
- The Lack of Integrated Water Resources Management (IWRM).

Meanwhile, view point of sanitation much more important to have serious attentions the following problems:

1. Provision of healthy water for nomadic people and rural population.
2. In hygienic disposal of sewage in urban and rural centers.
3. Contamination of underground water (Karez, spring, wells) and surface water resources especially from unregulated industrials expansion on water table.
4. Lack of laboratory centers for testing related to industrial, agricultural substantial in water resources.
5. Lack of sufficient awareness and community to participate in the waste management programs.

For preventing of water pollution and implementation of treatment actions and sanitary disposal of waste water in order to avoid water born diseases, organizing proper training programs through utilization of public media (television and radio) is important.

REFERENCES

Ahmad, M., & Wasiq, M. (2004). *Water resource development in Northern Afganistan and its*

- implications for Amu Darya Basin* (No. 36). World Bank Publications.
- Akbari, M., Ashoor, M., Chornack, M. P., Coplen, T. B., Emerson, D. G., Hubbard, B. E., ... & Verstraeten, I. M. (2010). *Conceptual model of water resources in the Kabul Basin, Afghanistan*. US Department of the Interior, US Geological Survey.
- Favre, R., & Kamal, G. M. (2004). *Watershed atlas of Afghanistan. Kabul: Ministry of Irriga.*
- Fuchinoue H. Tsukatan, T., Toderich, K.N. (2002). *Afghanistan revival: Irrigation on the right and left banks of Amu Darya* Kyoto Institute of Economic research.
- Fuchinoue, H., Tsukatani, T., & Toderich, K. N. (2002). *Afghanistan revival: irrigation on the right and left banks of Amu Darya. KIER Discussion Paper,554.*
- IMF Country Report. (2008). *Poverty Reduction Strategy paper. Islamic Republic of Afghanistan No.08/153.*
- King, M., & Sturtewagen, B. (2010). *Making the Most of Afghanistan's River Basins: Opportunities for Regional Cooperation. EastWest Institute, New York.*
- Livingston, I. S., & O'Hanlon, M. (2009). *Afghanistan index. Brookings Institute.*
- Marcotullio, P. J. (2007). *Urban water-related environmental transitions in Southeast Asia. Sustainability Science, 2(1), 27-54.*
- Mishra, C., & Fitzherbert, A. (2004). *War and wildlife: a post-conflict assessment of Afghanistan's Wakhan Corridor. Oryx, 38(01), 102-105.*