

## **Factors Causing Water Scarcity in Washuk District Balochistan**

**Sarfraz Ahmed<sup>1</sup>, Dr. Siraj Bashir<sup>2</sup>  
& Mumtaz Ali (PhD)<sup>3</sup>**

### **Abstract**

*With two thirds of the earth's surface covered by water, it is evidently clear that water is one of the most important elements responsible for life on earth. It is not only vital for sustenance of life, but equally essential for socio-economic development. Water is the unique gift of God and the basic requirement of life. Due to the high indulgence and exploitation of human being with nature, the global environment is changing every day. The fragile province of Pakistan Balochistan is facing the worst ever crises of water shortage for last many years, as water available for any given use has become increasingly scarce. The unexpected turn down in rainfall, excess usage and mismanagement in most of the upland areas of Balochistan are putting more stresses on water resources. The problem of water shortage particular in Washuk district falls it in the category of worse 'Water Scarce districts'. there are several factors those are crucially responsible for such situation, like unaware masses, excessive numbers of solar tube wells, lake of dames, lake of information regarding water scarcity and negligence from government, law enforcement authorities and civil society organizations, these all factors were also the basic reason behind the research study on factors causing water scarcity in Washuk Balochistan.*

### **Introduction**

Water is a god gifted product which bears lifecycle on domain of us, in the shape of animal's plants, or social animal's beings. Thus it's vibrant that in this somatic planet there can be no living activities without water as we see.

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<sup>1</sup> M.Phil Scholar, Department of Social Work, University of Balochistan, Quetta  
E-mail: [sarfrazhassni@gmail.com](mailto:sarfrazhassni@gmail.com) 0332-7835292

<sup>2</sup> Lecturer Department of Social Work, University of Balochistan, Quetta  
E-mail: [siraj.dr.siraj.bashir.edu.uob@gmail.com](mailto:siraj.dr.siraj.bashir.edu.uob@gmail.com)  
0321-3851070/0305-3884901

<sup>3</sup> Assistant Professor, Department of Political Science, University of Balochistan Quetta.

Although there is large amount of water in our earth but most of it is undrinkable. Nearly 71% part of earth has covered with water but unfortunately 99% is unusable for human beings and for other animals. only 3% is considered fresh water elsewhere 68% is in the shape of iceberg or frost cap and further 30% subsist is in shape of floor water and presently on 0.3% of wholly drink able subsist in figure of exterior water in stream, shallows, lakes and marshes (Dr Ali ,2015).Thus alike interval we discover that water is present in a limited volume, therefor large number of the world is experienced issue of water deficiency and almost one third of the humankind residents served water scarcity (Alam,2006).

In fact these ecological problems of 21 century not only get up in glob but also pursued in Pakistan. Where foremost issues Pakistan face is not terrorism, corruption or religious conflict, but water scarcity, approximately 80% of the population belonged to arid and semi-arid zone, categorized by extremely unpredictable, erratic and low rainfall. (UNDP,2017). A report of World Bank (2001) mentioned that Pakistan is a water anxious country where as per capita water usage is (1,700 cubic meters per year) around 2003 year. It was extended to 1,700 m<sup>3</sup> in 1992 and there was shortage of water in country, in 2002-2004 it has been dropped further to 1,500 m<sup>3</sup> and Water scarcity (1,000 m<sup>3</sup> per capita per year of renewable supply) are likely in about 2035 year on the basis of Government report, Though, giving the source of United Nations Development Programmed (UNDP) which gives Pakistan's present water accessibility is 1,090 m<sup>3</sup> per capita per year.

In adding up Balochistan is the largest province of Pakistan, making up approximately 43 per cent of the total area of the country. It is also the poorest and least populated province. And along with poorest and least population, Baluchistan facing the same least situation of water. Which is the most vulnerable province in Pakistan in context of water shortage. Balochistan, experiences water scarcity more than other provinces of Pakistan because it located in a very poor fertile region as well as far from Indus River (Bengali,2009).Although the main source of water is seasonal rainfall but, the last two decades shows a downward trend in the water table almost all regions of Balochistan due to lack of precipitation (Shah, *et al.* (2002). Therefore the situation is worst and water level is deteriorating day by day.

Somewhere deteriorating of water may happen because of famine, miss management and witlessness of the administration. Thus these factors make it more multifaceted and critical. As for as drought is well known to the occupier of Balochistan for extensive as drought has constant feature of the

region. According to Relief Commissioner of Balochistan (2000) the recent drought spell an assessed (29.29%) people were affected out of ~65 million in Balochistan, and the livestock populace was projected to be 22million and (36.59%) were affected.

Similarly experiences of water scarcity becoming worse and inferior in Washuk district as compare to other regions of Balochistan. Where in the last decades availability of water was heavily affected. The unexpected turn down in rainfall, excess usage and mismanagement in most of the upland areas of the district like Rakhshan, Shinger Qadir Abad and Basima etc, has caused an entire drying up the shell water and has decreased water output from springs and tube wells. There for researcher an attempts to recognize and guess the factors causing water depletion in chosen district of Balochistan (Washuk) and researcher recommended suitable measures of solutions. It can be tackled by increasing the upstream storage capacity in shape of big and mini dames, and the foremost step Baluchistan government should build a long-term strategy for water stress areas to prepare water policies, including public awareness, educational programs and research's regarding water shortage in whole Baluchistan in general and washuk in particular.

### **Objective of the Study**

- To identify the impacts of solar tube well on water supply.
- To identify the environmental and human factors affecting physical water shortage.
- To analyze the strategies and planning's of stakeholders of District Washuk regarding the issue.

### **Literature Review**

#### **Availability of Water**

Water has been considered as a free cost and vulnerable source since generations. Although 70% of the earth shallow is enclosed of water about 1400 million cubic kilometers (m km<sup>3</sup>). This abundant ratio of water means that this is the basic unit of living things, with out of this life will be seize .But out of seventy percent of surface water almost 97.5% of this water is salty being sea water. 35 m km<sup>3</sup> is only fresh water availability. And sixty seven percent is frozen in ice caps, while 30% is stored underground and only 0.3% is fresh and useable water on the surface of earth. Out of 87% of surface water lakes have 11% swamp and rivers 2% of water store, only 1%

of sweet water is extractable and used by Human beings. which is so alarming for upcoming generation (UNO,2006).

According to 2010 data from the United States, Food and Agriculture Organization (FAO), Pakistan's total water accessibility in a list of 26 Asian countries per capita ranks dead last. The country with a designation of annual availability of water is below than 1000 m<sup>3</sup> that it will be called a water scarcity country. Pakistan is probably to become water scarce by 2035, however some experts predicted that this dead last of water may happen as soon as 2020. However in Balochistan 39% accessible water in the province has been covered by Indus River and the major source of availability is irrigation system.

### **Water scarcity**

Water scarcity can be defined when single individual does not have reasonable water to fulfill her or his needs for washing, drinking, or the maintenances of his or her life, it said be water insecure person". And that area is called water scare area or water scarcity is an imbalance between demand and availability (FAO, 2010a) and exists when the demand for water exceeds the supply (Mogaka, H.; Gichere. S.; Richard D.; and Rafik Hirji,2006). Water shortage is a long-term inconsistency between demands and available of water resources. A major study, the Comprehensive Assessment of Water Management in Agriculture, make public that one in three people today face water shortages (COAG, 2007).

Another report of United Nation(2007), more than 1 billion of the humankind nowadays has being unable to intake water and UN institute that within in few decades almost (2.9) billions of people in 48 states will suffer from water deficiency that can undermine and push in to a dangerous situation some of states of Asia and Pakistan is one these countries. Pakistan has its origins in water shortage there for it face shortage of water. Likewise it would not be an overstatement to say that Balochistan is the most delicate territory in Pakistan. The basins of Pishin Lora and Nari has been observed as overexploited in grounder waters and considered as a threat to dry up the aquifers in future (Mustafa et.al, 2013). Thus most critical crisis that Balochistan is face in upcoming days is a water shortage.

### **Key Causes of water scarcity**

There are number of natural and nurture causes of this crucial issue of 21 century. Some of those written below.

## **Drought**

According to Pereira et al. (2009), “drought is well-defined as a usual but impermanent, disparity of water accessibility, containing of an insistent lower than normal precipitation” – an event of indeterminate regularity, time and strictness, follow-on in reduced water resources obtain ability, and compact the up left volume of the environment. There is emergent apprehension about the cumulative frequency and severity of drought in Pakistan (Ahmed et al.,2015). A substantial growth in the frequency of heat waves, assign of upcoming intensification and increasing harshness of drought, has been reported (Zahid & Rasul,2012). Meanwhile the deprived province of Balochistan in southwestern Pakistan contains of a rudimentary economy that depend on climate-sensitive segments such as rain-fed livestock, irrigated agriculture, and high reliance on and unsustainable manipulation of natural resources such as groundwater.

Upland Balochistan is the most heavily affected area of the province. Drought-affected districts that are particularly identified include Dera Bugti, Kohlu, Loralai, Zhob, Qilla Saifullah, Pishin, Qilla Abdullah, Noshki, Kharan, Awaran, Washuk, Mastung, Kalat, Khuzdar and Lasbela (UNDP, 2015); and Chagai, Lasbela, Kharan, Khuzdar, Kalat, Killa Saifullah, Loralai and Pishin (PDMA,2012).Hence this study provides several recommendations to strengthen institutionalization, awareness and sartorial strategies, for immediate, short-term, medium-term and long-term interventions for water management in province in general and Washuk in particular.

## **Abundance of private drilling equipment enhance tube wells installation**

Excessive installation of borings heavily affected the surface water in Balochistan, Water table was very stumpy where tube wells were out of order and it was profound in those areas where tube wells were working or natural drains were passing adjacent. And disorderliness of Private tube well drillers have made the work of water exploitation easier. The number of tube wells extracting water was 15525 in 1993 have reached to around 34000 in 2008 showing an increase of 90 % over a 15 years period (GoB ,2008).

Prior to 1990, the boring machinery was being dominated by few government departments like irrigation and power department, Balochistan Development Authority(BDA), Public Health Engineering Department( PHED) and Water and Power Development Authority (WAPDA). Meanwhile the rapidly increasing evolution of tube wells (solar tub wells) start viewing its effects on

the groundwater basins. WAPDA (1993) studied the groundwater circumstances in the three major regions Balochistan. Thus all the arid regions of Balochistan along with Basima Rakhshan and Shinger had no water left for future. Due to unplanned tube well(solar tube wells) installation and consequent indiscriminate pumping of water for the last two and a half decades, the area is now facing the problem of depleting groundwater table at the rate of more than 4-5 meters yearly , hence tube wells drying is a common phenomenon in Baluchistan.

Thus Re-boring and replacement of pump is required at many locations where tube wells are out of order, or government should make specific rules and regulation for the new installations of tube wells.

### **Population**

One of the keys causing factor of water shortage is condense population of globe in (2006) was 6.7 billion, which is 7.13 billion now growing at a quantity of 78 million/year that has extended. But unfortunately, it has been probably expected that this amount of worldwide masses will be up to (10.9) billion in 2050.And day by day among all this growing rate transpires in developing countries, already food, fiber, health and education problems facing in such countries like Pakistan. And rapid growth of population will put a massive stress on water use. Pakistan is the 6<sup>th</sup> most populated country in the world with a population size of 19.6 million, was rising at a rate of (1.52%) by the year 2014.(UNO, 2007a).

Although Balochistan comprises only 6 % of Pakistan population. But in contrast it would not be an exaggeration to say that Balochistan is the most fragile province in Pakistan. Land size is 44 percent of the total land of Pakistan which result the biggest province of the country by land. The most crucial dilemma that Balochistan is facing in upcoming days is a water shortage. Because population of the province is not a causing issue, while the province location is in an arid zone that experience lower level of rainfall. M. Khair Syed, J CulasRichard, & Hafeez Mohsin (2010) stated that Pakistan is the top ten countries that is facing water crisis, and the acute crisis of the country has directly hits Balochistan, where water shortage is extremely dangerous.

### **Inefficient irrigation systems used**

In the province irrigation systems work almost 45 percent efficiency due to poor management and less maintenance of water passages and channels, use

of incompetent and traditional methods of irrigation (mainly flooding). For the improvement; the tactic policies for maintainable agriculture should include measures to progress water management practices, reorienting and improving service delivery at the community level (GoB,2000). Lashari et al (2007) testified that in whereas due to the use of traditional methods of irrigation in Pakistan the irrigation efficiency is very low even not more than 60%, however in Western Australia irrigation efficiency was very much high 90% because they using high efficiency pressurized irrigation techniques.

### **Ecological and environmental factors**

The alarming situation of the water crises differ in each part of the world, and this completely depends on the fluctuations of the ecological, and environmental constraints. The problem of water supply between countries, its conventions and supervision has progressively engaged the substantial position in supervision the inter-state associations (Alam,2007). Due to this reason pure water “scarceness” (Jury and Vaux, 2005,Vörösmarty et al , 2010) have been accepted as a foremost worldwide environmental issue of the 21st era. These direct to enlarged reduction and deteriorations in water capacity and quality. This has significantly led to compact amounts of water available for utilization (Diwakar & Nagaraj,2002).

In fact these ecological problems of 21 century not only get up in glob but also pursued in Pakistan. However, most of the regions of the Pakistan lie in a dry and mountainous zone, characterized by highly irregular temperature and low precipitation. December-March and July-September(Monsoons) are the most important sources of rainfall in Pakistan where whole Indus plain obtains a usual precipitation of 212 mm and 53mm consistently (Enum,2013). Thus From the point of view of Intergovernmental Panel on Climate Change is directly or in directly interlinked to acute weather conditions like temperature waves, changeable precipitation and flash out all rainy water all of which build running water ever more challenging in international and local level.

### **Study area**

Washuk is a district of Balochistan, It was once part of Kharan District in Balochistan province. It was separated from Kharan and formed a new district in 2007. It is further subdivided into 4 tehsils or, 10 union councils and 216 mauzas (villages). Washuk District is spread over 29,510 km<sup>2</sup>, of which 71,520 hectares is arable. Geographically, District Washuk is mountainous in the south bounded by Siah Range, separating it from the

RakhshanValley and Panjgur District. Eastern mountainous region is known as Ras-Koh Range and separates Washuk from Gidar and Dasht-i-Goran valleys in Kalat and Besima in Awaran District. Washuk District of Balochistan was selected for this study. Where 200 respondents were interviewed through interview schedule to investigate the factors causing water scarcity in Washuk Balochistan.

### **Research methodology**

This article is based on a study that investigate the factors causing water scarcity in Washuk Balochistan. For data collection researcher used technique of interview schedule with closed and open handed questionnaires. The primary data was collected from 200 respondents (Govt officials, experts and concerned stakeholders) at Washuk district, and the relevant secondary data was collected through variety of sources such as research journal articles, published newspapers articles , books , etc.). Further researcher design sampling through probability sampling (random sampling) to ensure assessment of research study.

### **Results and Discussions**

**Table No.1**

**Percentage Distribution Regarding the factors for water crisis at District Washuk**

<b>Factors</b>	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Environment	72	36.0	36.0	36.0
Man made	128	64.0	64.0	100.0
Total	200	100.0	100.0	



**Data interpretation:**

From above table the researcher asked questions from respondents that what factors responsible for water crises are? After data analysis the given data shows that 64 percent people considered human being responsible for these crises while 36 percent numbers of people declared environmental factor for this global crises of water.

**Table No.2**  
**Percentage Distribution Regarding human made factors for water shortage**

<b>Human Made Factors</b>	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Lack of planning	56	28.0	40.0	40.0
Lack of awareness	13	6.5	9.3	49.3
Ignorance of Govt	71	35.5	50.7	100.0
Total	140	70.0	100.0	

**Data interpretation:**

From above table the researcher asked the question from respondents that if humans are responsible for depletion of water then how? In which most of the people declared ignorance of government as cause for water depletion which is 35 percent. Similarly, some people considered lack of planning as another cause while remaining people with frequency of 28 percent and the lack of awareness is one of the key factors of water shortage according to respondents which covered 6.5 percent.

**Table No.3**

**Percentage Distribution Regarding, Are you understood that solar tube well system is one of the key causing factors of water depletion?**

	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Agree	144	72.0	72.0	72.0
Disagree	22	11.0	11.0	83.0
Strong agree	22	11.0	11.0	94.0
Strongly disagree	12	6.0	6.0	100.0
Total	200	100.0	100.0	

**Data interpretation:**

Similarly the researcher in table No 03 tries to know from respondents that do you understand that solar tube well system is one of the key causing factors of water depletion. After the data interpretation 72 percent answered that yes solar tube wells are one of causing factors of water depletion, 11 percent of people strongly agreed, 11 percent respondents disagreed while 6 percent of respondents strongly disagreed from above asked question.

**Conclusions and Recommendations**

There are several crucial findings were traced during the data collection process from the respondents of Washuk Balochistan in regard of factors causing water scarcity, research study concluded that water is one of the most important elements responsible for life on earth. But today large number of the world is experienced issue of water deficiency along with Pakistan. Since groundwater level in many regions of the country is quite dynamic, but there is dramatic shortage of water were examined at concerned area. In 2018 water table of concerned area (Washuk) increased from 153 average feet to 170.5 average feet.

The main cause of water shortage is mismanagement of water for production, irrigation, excessive number of solar tube wells installation, and ignorance of government on water resources. The study was found out approximately 500+ average solar tube wells are currently running. There for under no circumstances deep tube well would be allowed to be sunk in shallow zone. Importance of awareness and attention should be given on groundwater recharge. Most important government should construct of adequate mini and big dams at required sites. In order to construct dams in conformity to store surface runoff/flood water.

### **Recommendations**

The researcher wishes to make the following recommendations.

- Most important government should construct of adequate mini and big dams at required sites.
- Under no circumstances deep tube well would be allowed to be sunk in shallow zone. Therefore District Government should realize his responsibilities. By making affective water control board under the supervision of deputy commissioner in order to regulate the tube wells.
- Government should utilize modern technologies in order to minimize water wastage by drip irrigation system, providing advanced pipeline system, well-constructed pond for farmers, to control the wastage of water.
- Government should Rehabilitate and improve of Kareez system where possible.
- In addition government and local notables should be creating awareness among the people about storage and minimizing wastage of water.
- It is essential that a fair water pricing model is formulated and implemented by the competent regulatory institution.

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