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# Water, the Backbone of Life and Economic Stability

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**Abstract:** Water is essential for human life, development and environmental, but it is a finite and vulnerable resource which has qualitative limitation and quantitative vulnerability (Lalzad, 2007). The mere fact that in most of the cases, it is easily accessible, exposes it to some vulnerability to a certain extent. It has a potential of getting misused and ultimately arrive to a point where it gets finished from its source, particularly during non-raining periods. Its significance is generally not being recognized by most people, particularly those who have not yetbeen exposed to its scarcity. CES (2007) states that, the importance of water to human life is ranked second, following after oxygen.
Water availability always goes hand in hand with water quality. Water of poor quality isa health hazard and require purification before use. Purification which comes at an expense, hence it's often not done by people in rural areas, due to their non-affordability,ultimately making them daily victims of water related illnesses. Bigas et al (2012), talks about water, as a base of health, nutrition, equity, well-being and economic progress, particularly in developing countries. Important factors such as good health and well-being are the results of qualitative water. Water of bad quality is highlyinfectious and risk to human nature and livestock.
On the other hand, development of any kind is, somehow dependent on the availability of water. UNDESA (2015) states that, water is at the core of sustainable development and critical for socio-economic development, healthy ecosystem and for human survival. Development is also associated with economic growth, hence without development the economy is very much likely to collapse. In the process of development, jobs opportunities are created, hence improved economy is eventually achieved during the whole process.
According to Irina Nokova, the director general of UNESCO, water and jobs are inextricably linked on various levels, whether we look at them from an economic, environmental or social perspective (UNWWAP, 2016).
**Keywords:** Human Life**,** Water Quality,Development, Economy

## 1. Introduction and Background

Water is the source of life and development on earth. Not only human life, but plants and animals are largely dependent on water for their existence on earth as well. Sustainable life, goes together with finding a sustainable job, and be able to put food on the table eventually. The inter-connection among factors surrounding water is a concrete bond that forms cycle around all living species on planet earth i.e. economy, life, etc.Plants and animals which are dependent on water, forms part of food eventually. Where food production is directly linked to economic development and creation of job, and ultimately economic stability for a particular country.
It is estimated that over one billion jobs, representing more than 40% of the world's total active workforce, are heavily water dependent (UNWWAP, 2016). These jobs are found in agriculture, forestry, inlandfisheries, mining and resourceextraction, power generation, water and sanitation, as well as in several manufacturing and transformation industries including, pharmaceutical and textile (UNWWAP, 2016). One third of a billion of other jobs are in some way moderately water dependent, meaning they would never function fully without the availability of water. These moderate water dependent jobs include, construction, recreation, transportation and manufacturing/transformation industries such as wood, paper, rubber/plastic and metals (UNWWAP, 2016).
Water is an irreplaceable resource. In its unavailability, life is basically impossible on earth. Same applies to economic stability, which is dependent on development and production. Without waterno development, nor production could occur, hence no economic stability would be found under such circumstances.
Countries with water scarcity, or affected by drought,usually have unstable to poor economy in general. The agricultural sector is the largest user of water, through irrigation practises (Peterson &Klepper, 2007). Some of these countries are largely dependent on the agricultural produce to export to the outside countries, which ultimately plays a major role in boosting their economy i.e. Burundi, Liberia, Somalia, Guinea-Bissau, and Central African Republic. (World Factbook, 2017).

## 2. The Scope and Objective Of The Study

Thestudy talks about the usage of water in general and its effect towards economic stability around the globe. It elaborates more on the importance of water to life of the living species on earth. The study further

givea broader picture about how various scenarios and activities are inter-connected to the availability of water.The study, talks about water at a greater extent, and scales it down to a personal responsibility.This helps makes a valuable impact towards the main objective of the study of how an individual can behave to bring about positive change with regards to the water situation.

The main objective of the study is to create awareness about water.Through the study, it is made much clear that, without water the continuation of life and economic advancementis impossible. Taking for instance the water situation in South Africa which is not at a so good state, but when taking a closer look at our neighbouring countries, through this study,it is made visible that if, no better interventions or changing of attitudes occurs, the situation could go from bad to worse as well.

## 3. Reasons Behind Water Scarcity

According to UNEDSA (2015), water scarcity is the combination of human-made phenomenon and natural reason. It is believed that, generally there is enough water on earth to accommodate everyone on the planet earth. But, according to UNCCD (2013), with the available water on earth, there is only 2.5% of freshwater, where less than a percent of this water is usable for ecosystem and humans. This means, massive amount of water require purification before it could be made available to the end users.Peterson &Klepper (2007) argue that, even though the water is seemingly enough for everybody, it is not evenly distributed around the globe. Creating a situation where some people utilize water excessively and some just don't get access to it at all. Such situation is a result of countries that boost largely with certain sectors and developments that utilise a lot of water i.e. agricultural sectors andpower generation.

Water scarcity can be elucidated as ascenario where demand for water exceeds available supply.Following is some of the reasons that could be associated with water scarcity:

**Climate Change**

Climate is the most unnoticeable but effective factor, that plays a great part towards water scarcity. Even though earth is largely covered by water, this water is salty and unusable (ISDR, 2007). According to the Grantham Institute, about 98% of earthly water is salty, leaving about 2% of water that is regarded as freshwater, but 70% of the 2% is snow and ice (The Guardian, 2012). The increased heat, which is one of the effects of climate change, results in the melting of the ice, which ultimately get washed into the sea and ultimately becomes unusable (Morrison et al, 2009).

The increased heat, associated with climate change, also result in evaporation of water from dams, rivers and even underground water, which are the main source of freshwater. With many countries dependent on underground water for their daily activities, the underground water is getting exhausted due to too much sucking.

**Poor Water Management**

It can't be denied that a large amount of water could be saved through proper management of water. This management does not refer to the supplies of water only but to the water end users as well.

Commonly so, the water supplyinstitutions tend to turn a blind eye towards proper management of water. These water institutionsresponsible for supplying water to the people are believed to have been infiltrated by politics and become too busy looking at their job securities of their respective departments rather than making provision of water. This resultin incorrect appointment which are politically influenced rather than job competency based.

The unawareness of end-user about the water situation of their respective areas is a problem on its own. They are unfortunately not aware that, water levels are dropping around the globe. On the 07$^{th}$ of June 2017, the Republic of South African government issued a statement that, their dams were gradually dropping once again (DWS, 2017). This has not been in South Africa only that these water sources are losing water rather than over flowing. It was back in year 2015 when Frankel (2015) reported about the sources of freshwater being depleted in various countries around the world, and that the underground was being sucked to an extent that is also running dry. According to Franklin (2015), these countries were already passed their sustainability tipping point, meaning more water was removed than replaced during the decade-long study period. Should people have been aware of such findings, perhaps their attitudes and behavior could have been better, or be in a state of being altered.

**Drought**

Drought is one of the major threats among natural hazards to a person's livelihood and socio-economic development (ISDR, 2007).It does not frequently occur, but in its occurrence, it turns up fatal to people, plants and animals. The recovery to it usually takes years, even after things are back to normal.

Even though, today's technology has improved to an extent that it is possible to have a year-long forecast of precipitation, which enables one to have a clear idea if the year is going to be the driest, normal or rainy. Under such circumstances, the drought still continues to catch everyone off-guard. There are no intervention done prior, to avoid deaths and excessive inconvenience caused by natural disaster such as drought, instead government authorities/institutions become eager to act when faced with such situation, and as soon as things come to normality, the eagerness wanes.

Economically, drought becomes even more severe. The businesses, particularly crop and meat farmers, start to make means to get water for their crops and animals. They end up drilling their own wells or even buy water tankers from far places. Their yield is obviously affected, as their livestock usually die either through thirstiness or wild fire which are more frequent during drier periods. Prices reach sky high in order for them to be able to run their businesses. The suffering comes to the consumers who has to increase their means of living in order to maintain correct diet of food.

**Poor Water Infrastructure**

The collapse of old water infrastructure is the obvious reason that result into water scarcity. Large amounts of water get lost through leaks. Infact, it is believed that if water that is lost through leaks was being saved droughts would never be as severeas usually get. Take for instance, South Africa alone is reportedly losing about 37% of their freshwater through leaks in year (Moloi& Watson, 2015). Also Montreal is estimated to lose about 40% of their water (LaBrecque, 2015).Lastly, Schaper (2014) wrote that, according to the researcher in Manhattan alone, an estimated 2.1 trillion gallons of water is a total estimation of water lost every year through poor infrastructure. Taking into consideration the large percentages of water losses in these different countries, it is clear that if this water was being saved, it could have made much of a difference towards avoiding scarcity.

Large amounts of money are invested in maintaining and repairing collapsing infrastructure, making the process to supply water to those without it at all extremely slow. The appointments of incompetent contractors to construct these water infrastructures, such as water pipes and reservoirs bring about the poor quality of work which does not last the required life span of a particular infrastructure.

**Increased Population**

Population increase while the water storage capacities are kept at the same volume is a real problem, which also contributes to water scarcity. Excluding the birth rate which increases the population of all the areas in the world, there is migration which occurs frequently in all the cities of the world. This has resulted in increased townships developments around South African cities or towns, as people are moving closer to jobs, schools and better service supplies such as electricity, water and health care. These movements ultimately puts a massive strain to these service deliveries such as water. The common mistake by the responsible authorities is that, where there are new development, like a township, when it comes to service supply, they squeeze them in from the supply services of urban areas, to an extent that they construct new reservoir for their convenience reason and good pressure of water, but do not take into consideration the source where this water will be coming from.

Hence the sources of these reservoirs and tanks run dry eventually. If no means to source water are developed, the existing ones will not handle the population growth. With increase of population, businesses get opportunities to expand their businesses as they make more profit through improved purchases than before. With such improvement for businesses, the next thing is they increase their production, something that ends demanding more water for their sectors i.e. agricultural.

## 4. The World's Most Water Stressed Countries

The already mentioned reasons behind water scarcity occur in all corners of the world. The only difference is that, the effectiveness of their consequences is not at the same level all around the countries. The reason for that, is that some areas have more rains than others and some are wealthier than others, enabling them to slow down the severity of water scarcity.

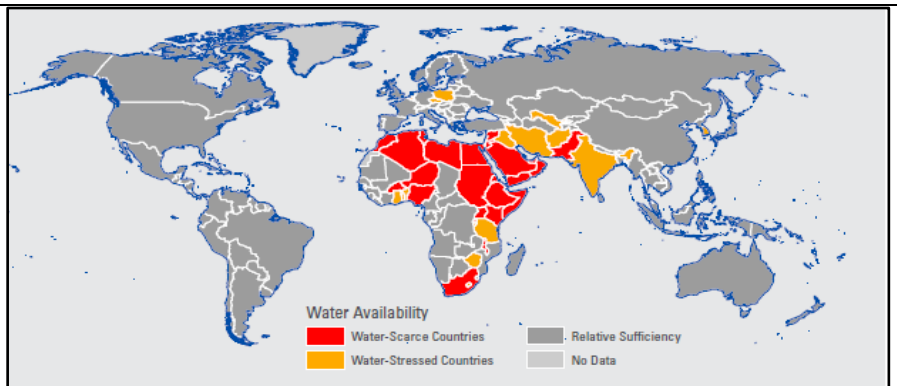


Figure 1: Water Situation based from 2010 Population Figures provided by the UNPD for various countries around the world (obtained from Mogelgaard K, 2011)

Figure 1 above is an illustration of freshwater availability in relation to 2010 population figures provided by the United National Population Division to produce a per capita rate. The dominance of water scarcity is relatively high in the sub-Saharan African regions as per figure 1. This is associated with insufficient water sources such as dams and some water infrastructure. The economy of these countries is in a dire state, lives are being lost through hunger and thirsty.

These countries are dominated by wars, resulting in too many bombings that ultimately dismantle the infrastructure put underground and underneath the buildings. Their economic condition is not improving as their focus is not on developing water resources but they go back and forth fixing demolished buildings, and instead maintain existing resources rather developing new ones. These countries with water related problems as a result perform very poor when it comes to businesses that are extensively dependent to water i.e. Agricultural produce. Some of the areas shown in figure 1 did not have conclusive information to provide reliable findings with regards to their water situation. Even if they are falling into a water stress situation rather than the water scarce or their water status might be normal at the current moment, the final fact is that, around the world the water status is changing for the worse rather than the better. It might currently be difficult to determine how these reasons behind water scarcity influence the water situation, but a longer forecast versus some of these reasonsn provide a closer anticipation.

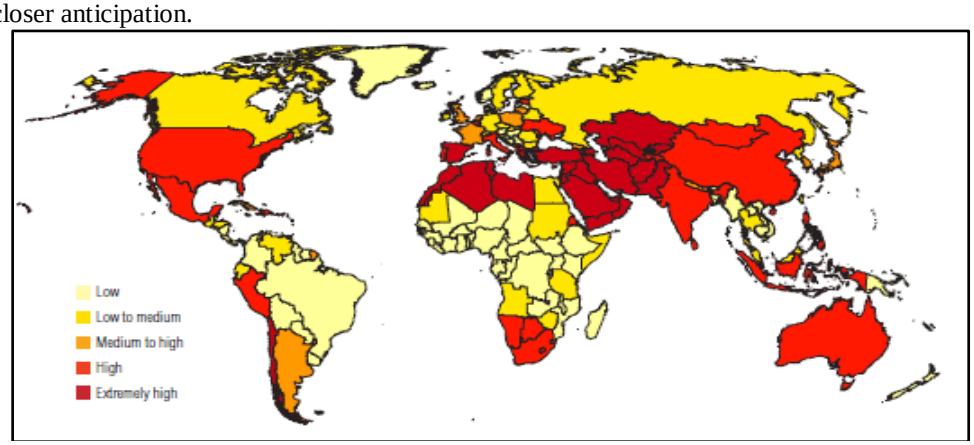


Figure 2: Presentation of Water Scarcity by year 2040 under the business as usual scenario (obtained from Young et al, 2015 of World Resources Institute)

Figure 2 above illustrates a forecast of water scarcity by year 2040. It is understood that there are certain factors in certain countries that could contribute to the situation of water availability, but those could not really be predicted. Hence the determination of this forecast is only based on obvious global scenarios like the climate change, country's economy and population (Young et al, 2015:6).

In comparison of figure 1 and 2, very little to no improvement will be achieved by year 2040 with regards to the improvement of water situation, instead additional countries will be at bad water state, unless they can act otherwise currently. The scale at which big countries are growing their businesses such as agricultural industry is having a negative effect towards freshwater supply to these countries, hence in some areas shown in figure 2, you would suggest water is not a problem, but the utilization is just too high for the water resources to refill and stay normal.

## 5. The Economic Indicators for the Economic Role of Water

Water is crucial for the economy. Every industry from agriculture, electric power and industrial manufacturing to beverage, apparel, and tourism relies on it to grow and ultimately sustain their business. The business sector is sitting with a situation where their tanks are running dry, even worse, the future holds no promise of improvements, instead worsening conditions. At the moment, they spend a lot of money just to secure potable water for their day to day running of business. Water Pollution is one factor that plays a role in water scarcity, and these businesses have to make measures to purify water.

The association of water and economic is clearly indicated in the absence of water, particularly during drought period. Food prices quickly react, beginning from the farmers where crops, milk, and meat reach sky high. The agricultural sector is a dominant industry in water usage, and the economy of many countries is largely boosted by the production of this sector.Table 1 below illustrates how various areas around the world are doing economically. Table 1 shows the Gross Domestic Product (GDP) in relation to the agricultural produce.

Table 1: Indicators for the economic role of water (Source:Peterson &Klepper, 2007)

| | **BIP-Share of VA in %** | | **Water Use in $m^3$ per 1000 USD** | | |
|---|---|---|---|---|---|
| | **Agriculture** | **Industry** | **GDP** | **VA Agriculture** | **VA Industry** |
| **World** | 04 | 27 | 122 | 2317 | 93 |
| Low Income | 19 | 24 | 1044 | 3182 | 279 |
| Middle Income | 10 | 35 | 314 | 2268 | 189 |
| **Low & Middle Income** | 11 | 32 | 471 | 3182 | 203 |
| East-Asia & Pacific | 11 | 44 | 380 | 2238 | 221 |
| Central Asia & Eastern Europe | 09 | 30 | 420 | 2760 | 450 |
| Latin America & Caribbean | 06 | 36 | 130 | 1615 | 52 |
| Middle East & North Africa | 15 | 34 | 619 | 3544 | 102 |
| South Asia | 24 | 40 | 1399 | 5223 | 187 |
| Sub-Saharan Africa | 09 | 16 | 130 | 1169 | 45 |
| **High Income** | 02 | 26 | 36 | 884 | 58 |
| European Union | 02 | 26 | 28 | 491 | 54 |
| United States | 02 | 25 | 49 | 1338 | 98 |

The data shown in table 1 above is a typical indication of the importance of the agricultural produce towards the economy, especially in South Asia and Africa, and Middle East and North Africa shows the largest amount of water required in agriculture per dollar value added (Peterson &Klepper, 2007).

## 6. Recommendations

The degree of importance of water can never be reached. The only effort to be done is to promote awareness about its finite element. The fact that, most people see water running in nearby rivers and close-by dams tends to take it lightly. Takefor instance, in South African villages,water is supplied closer to end-user for free. This result in massive misuse of water, where people do their illegal connections and manage to bring water into their yards, resulting in even greater misuse.

The government is providing the so called Rural Development Programme (RDP) standard supply of water, where taps are put in such a way that no one walks a distance of over 200m. Taking into consideration the fact that thesame government recommends that these contractors putting these taps in villages should employ local people through the Expanded Public Works Programme (EPWP), so as to better people lives by the time they complete the water supply projects. These same people who were employed end up being the ones doing illegal connection for the community after the contractors have completed and left the site of work. It would be recommended to the government to consider, putting rates to all water users, while considering the standard of living and affordability i.e. low standard, medium standard and high standard.

Putting rates onto all potable water users would bea method of promoting responsible water use. Furthermore, various water conversation methods would need to be introduced, as people will also be eager to cut-cost of their water usage. Generally speaking that would economically benefit the world's ecosystem at large, where water utilization will decrease. When looking to big water users, it would be a great idea to have a strategy where they do not solely depend on governmental supplied water but consider developing their own dams.

Lastly, the household dwellers would consider rain harvesting, because the fact is, saving more water saves the economy as more water is available.

## 7. Conclusions

It was evidently demonstrated by the study, how life would not be able to continue without access to clean potable water. Water is the source of nutrition, hence polluted water is advisable not good for intake due health risks. Hence awareness to the water users is vital, to save lives and our economy. The greater water polluters is industries but the household users also have a massive contribution that pollutes their surrounding waters. It's understandable difficult to ensure that the message regarding water awareness reaches everybody in the entire world, but authorities need to put more money to advertise these promotions on national televisions and radios. This method proved vital here in South Africa during the electricity crisis, where each and every electric user was aware of the crisis that was going on.

The start to solve the world's water problem begins with the correct attitude at the household. The people who run the industries have houses, and if they would change their attitudes towards water at their own house, that element would make a difference at their work as well. If they know that they need to take care of water quality and water wastage at their households that same practice will come automatically at the work place.

The economy part that is dependent on water, could only be saved through correct water usages and practices. A little bit of water that one savesa day, adds to another day of staying without being thirsty.

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