

Research Report

MUNISH '12



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Forum: Environment Commission

Issue: Improving Water Management in LEDCs

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Introduction

Water is a universally recognized basic human need. Currently, most of the Western world has safe and easy access to clean water; however, there are still many in less developed nations who have little or no access to safe water. Often, the absence of water is not the problem, but it is the proper treatment of water that many are unaware of, or without the proper resources to perform. 11% of the global population has no access to clean drinking water¹ (UN), resulting in 3.4 million annual deaths caused by waterborne diseases² (WHO). This thus proves that access to clean water is still very much a relevant, critical problem in society today, caused by a lack of knowledge, technology and resources to process water in many nations. This problem specifically tackles Less Economically Developed Countries (LEDCs) because it is mostly only in these countries where governments can't afford clean, safe, access to drinking water for all its citizens, it is only in these nations where water management is not sufficient and needs to be improved.

Definition of Key Terms

Less Economically Developed Country (LEDC)

This is a term used to describe relatively poorer countries with a comparatively less stable and successful economy, an economy that still needs to develop and grow. Other (non-official) terms include 'developing countries', 'third world countries' and 'underdeveloped countries'. (See *appendix for categorization of LEDC nations*)

More Economically Developed Country (MEDC)

In contrast to LEDCs, this is a term used to describe relatively richer countries with a comparatively stable, developed and successful economy, usually with a better standard of living. . Other (non-official) terms include 'developed countries', 'first world countries' and 'Western countries'. (See *appendix for categorization of MEDC nations*)

¹ Walker, Jade. "Clean Water: World's Nations Meet U.N. Target For Safe Drinking Water Ahead Of Schedule." *The Huffington Post*. TheHuffingtonPost.com, 06 Mar. 2012. Web. 2 June 2012. <http://www.huffingtonpost.com/2012/03/06/clean-water_n_1323175.html>.

² "WHO: Waterborne Disease Is World's Leading Killer." VOA. N.p., n.d. Web. 2 June 2012. <<http://www.voanews.com/content/a-13-2005-03-17-voa34-67381152/274768.html>>.

Waterborne Diseases

“Waterborne diseases are caused by [pathogenic microorganisms](#) that most commonly are transmitted in contaminated fresh water. Infection commonly results during bathing, washing, drinking, in the preparation of food, or the consumption of food thus infected.” (Wikipedia, 2012) These diseases are named waterborne because they are spread through or originate from contaminated water. Such diseases include cholera, salmonella, typhoid fever and hepatitis A, many of which could escalate to become fatal, especially without quick detection and proper treatment, which is difficult to find in LEDCs, especially in areas where these diseases are most prevalent.

Water Management

Water management means, in its most literal sense, the organization and treatment of water. In this specific case, water management is a broad term that covers everything related to water use in a nation. This not only includes proper water treatment, but also irrigation, distribution of water and setting limits to the amounts of water allocated for each water use in a nation. How a nation treats, distributes and uses its water all falls under water management.

Drought

Regardless whether a natural or man-made phenomenon, a drought refers to the extreme lack of water in an area. *“Drought is a condition of moisture deficit sufficient to have an adverse effect on vegetation, animals, and man over a sizeable area.”*³ (Warwick, R.A., 1975) Droughts are obviously largely linked with efficient water management, because successful water management can both prevent droughts, but is also severely damaged as a result of droughts. Countries frequently suffering from droughts are often both LEDCs and countries with poor water management, largely caused and worsened by the drought-prone climate

General Overview

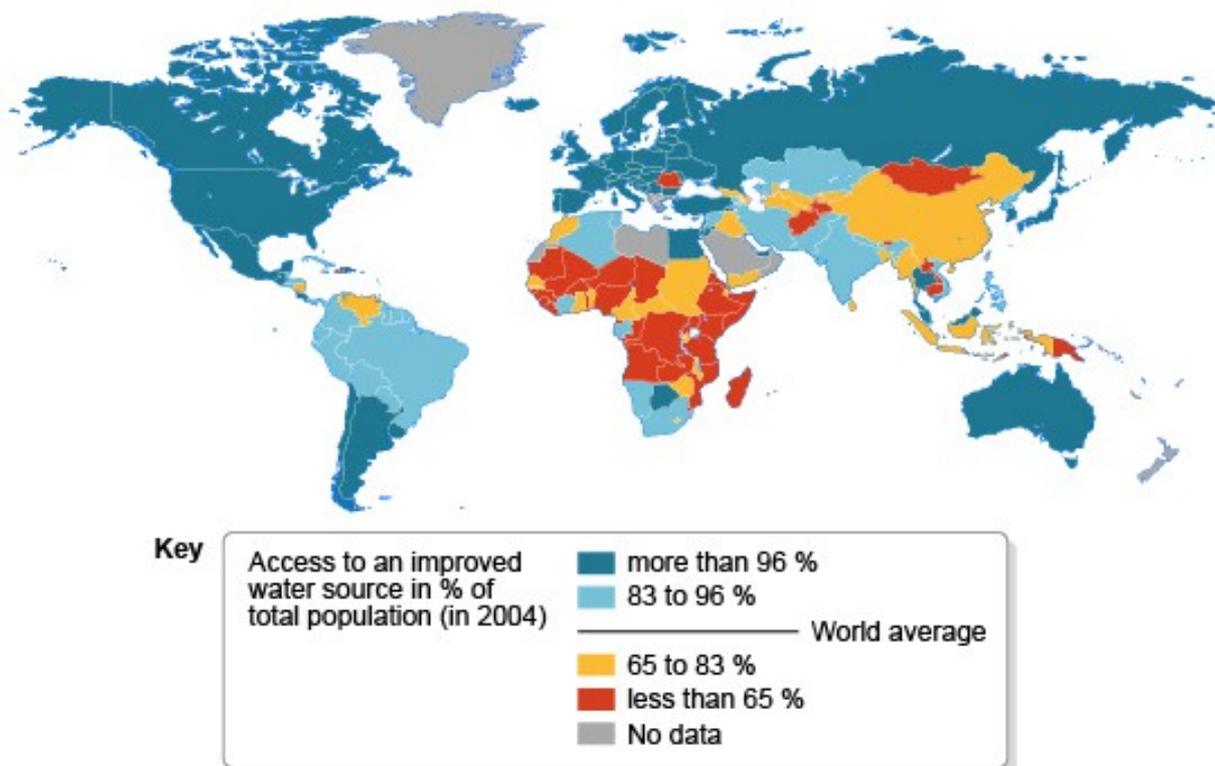
Current Situation

In many areas of LEDCs, water management is a problem. Nations are unable to supply safe, clean water to all its citizens, especially those in rural areas, due to the lack of proper infrastructure, irrigation and water purification means. 1 in 8 of the global population do not have access to safe water, with 60 million children born each year in LEDCs live with no access to sanitation⁴. This results in fatal diseases caused by the lack of clean drinking water and the consumption of contaminated water, supported by the statistic that 700,000 children die every year from the waterborne disease of diarrhea,

³ "MD-DE-DC Water Science Center Drought Watch." *Drought Watch*. N.p., n.d. Web. 2 June 2012. <<http://md.water.usgs.gov/drought>>.

⁴ *BBC News*. BBC, n.d. Web. 2 June 2012. <http://www.bbc.co.uk/schools/gcsebitesize/geography/water_rivers/water_usage_rev5.shtml>

this equaling out to almost 2000 children a day⁵. There are a number of causes for the lack of water management in LEDCs, these also being hard obstacles to work around, proving the problem to be a long-term one of dire importance. See below for a map indicating the percentage of each nations population with access to clean water:



Obstacles Faced

Uneducated

A major cause contributing to the lack of proper water management and treatment in LEDCs is simply that locals are uneducated on how to properly treat water. Often, basic water purification is a very simple process requiring little materials or tools, and is enough to ward off many waterborne diseases. Yet, because locals don't know these methods and don't realize the importance of them, they are unable to employ them, and thus continue to drink contaminated water even though it could easily be avoided. Furthermore, often, locals are unable to recognize dirty water from clean, and even whilst realizing water is dirty, they do not know the full severity of many waterborne diseases that could easily result from the drinking of that water. Consequently, they give in and drink the water anyway, underestimating the consequences. On top of that, local hospitals and clinics are usually incredibly poor and uneducated, only aware of simple methods of detecting and treating disease, usually only detecting a disease when its too late and simple treatment is no longer effective. The lack of education happens thus both in locals not knowing

⁵ *Statistics*. N.p., n.d. Web. 2 June 2012. <http://www.wateraid.org/uk/what_we_do/statistics>.

how to treat water properly, but also in hospitals and clinics not able to detect diseases quick enough or treat them effectively enough. These two together make a deadly combination that surrenders with little protest to deadly waterborne diseases.

Water Shortage (Drought)

Despite the problem often being a lack of clean water or water purification resources/knowledge, the fact that many LEDCs experience severe droughts and water shortages is also a leading cause and certainly doesn't help the situation. Water shortages make it even harder for proper water purification and management, as there is less water to process and water itself becomes a scarcity, no matter clean or dirty. Water shortages have become more and more prevalent and unpredictable in LEDCs, as climate change makes climates more and more volatile, extreme, unstable and unpredictable.

Poverty

In addition to a lack of knowledge, poverty is of course also a leading cause of water problems in LEDCs, and usually the source of almost all problems in LEDCs. Because of poverty, nations cannot afford the resources necessary to purify and properly manage water at a large scale, unable to sustain any consistent, long-term supply of clean water for its entire people. Poverty is the core cause of the lack of water management in LEDCs, making it extremely difficult for many people in rural areas to live a life of reasonable hygiene or sanitation.

Growing Populations/Cities

Another major contribution to the problem is the growing populations and urbanization in LEDCs, making it even harder to provide efficient, sufficient clean water, as more and more people demand water, many of which live in condensed cities with poor infrastructure and thus poor sewage systems as well. The rapidly growing populations of LEDCs make it even harder for governments to accommodate and improve water management, as the demand for water is rapidly increasing.

Insufficient Irrigation of Water

The lack of proper water transportation is also a big problem in many LEDCs, especially ones with large surface areas and spread out cities. In these nations, water needs to be efficiently and effectively transported from city to city, often over very long distances to high-density populations in nearby cities. This is especially the case if there is no consistent water source in the cities themselves, and the large water demands need to be met by bringing in water from elsewhere. An efficient method of water transportation and irrigation is incredibly expensive to set up as well as maintain, thus hard to achieve in LEDCS. However, without it, much water is lost and contaminated in the process of transportation, hugely contributing to water problems

prevalent in many LEDC cities.

Improper Sewage Disposal

Often, clean water is contaminated by the disposal of raw waste into it, due to the lack of proper sewage systems in LEDCs. Whether the waste is directly dumped into water systems or leak from sewage systems to water systems, the consequences are equally disastrous. The toxins in the waste contaminate the water such that it can no longer be used without proper chemical purification, which requires skills and resources most locals in LEDCs do not have. This makes clean drinking water very scarce in LEDCs, and leads to many water-borne diseases caused by the consumption and use of contaminated water. This problem is in essence relatively easy to solve. If sewage systems could be improved, the problem would be hugely reduced. However, this potential solution requires not only money and attention, but also specific expertise, which many LEDCs simply don't have.

Consequences

Disease (Mortality)

The most obvious and dire consequence of inadequate water management is disease and high mortality rates. Waterborne diseases originate from contaminated water, and such diseases are extremely deadly in LEDCs where clean water can't even be afforded, let alone fast, appropriate medical treatment. These waterborne diseases and the lack of the proper treatment have dire consequences on a nation's life expectancy, and both could be hugely alleviated with improved water management. For example, in the 1880s, investment in the UK's water and sanitation infrastructure hugely contributed to a 15 year increase in life expectancy in the following 4 decades. It is thus clear that the quality of water can hugely increase one's life expectancy, especially in LEDCs where millions die from preventable diseases every year. The increase in waterborne disease cases also results in increased mortality rates, which obviously negatively affects a nation's economy, society and development, as it decreases its workforce, increases the burden of healthcare, and ultimately stimulates negativity in morale in its entire people.

Famine

Famine also develops as a problem due to the lack of water in agriculture. Most LEDC nations depend on agriculture or primary manufacturing for their goods. However, with the lack of clean water follows the contamination and negative consequences on agricultural land and crops. Without water, farmers are unable to produce their maximum potential of crops, unable to sell them locally or globally, and thus unable to feed themselves or buy food as their income has hugely decreased. This shows that a lack of clean water can spread much further than just to

waterborne diseases, as diseases related to malnutrition and starvation can also arise from this, as these resources are all interconnected and interdependent.

Environmental

The lack of clean water is also a burden on the environment, as contaminated water not only harms humans, but also surrounding biodiversity and nature. Although this is a minor consequence compared to the spread of waterborne disease mortalities, it is a consequence that will slowly build up to destroy surrounding nature, making it even harder and harder to find clean water and hygienic lifestyles.

Social

Because water is so difficult to obtain in many countries, it has become a constant worry on people's minds. It takes up hours of their time just to obtain a bucketful of relatively clean water. For example, women in Africa and Asian often have to walk for hours, transporting up to 20kg of water on their heads. Furthermore, 1.1 billion people live more than 1km away from their closest water source, and thus only use 5 liters of (often unsafe) water a day⁶. This is, apart from the health implications, also a huge social inconvenience for families, because a constant water supply is never ensured or guaranteed. This means that the lives of such families constantly revolve around survival and obtaining clean water, leaving little time to make a living or constructively contribute to their society.

Long-term Importance

Proper water management is of utmost importance, not only because of its short-term consequences, as mentioned above, but also because it has long-term effects. The long-term consequences of improper water management include first and foremost that it proves to be an obstacle preventing a nation's proper development. MEDCs spend a fortune on development aid yearly, however, for example, the cost of the lack of water, sanitation and hygiene in Sub-Saharan Africa alone causes a loss in GDP that is higher than the amount of development aid the entire continents receives in a year⁷ (UNDP) It is thus in everyone's interest to invest in better water management in LEDCs, as in the long-run, every \$1 invested in water and sanitation will produce a \$4 returned in increased productivity, allowing a nation to slowly, but independently, develop and help itself⁸. Furthermore the Millennium Development

⁶ Statistics. N.p., n.d. Web. 2 June 2012. <http://www.wateraid.org/uk/what_we_do/statistics>.

⁷ Statistics. N.p., n.d. Web. 2 June 2012. <http://www.wateraid.org/uk/what_we_do/statistics>.

⁸ Statistics. N.p., n.d. Web. 2 June 2012. <http://www.wateraid.org/uk/what_we_do/statistics>.

Goals states the hope to half the proportion of people living without sanitation by 2015, a target that the world is currently 150 years behind in.

Major Parties Involved and Their Views

LEDCs

LEDCs are of course the focus of this issue. Water management issues and problems are mostly solely prevalent in such lesser developed nations. Thus all LEDCs suffering from water scarcity problems are hugely related to this topic. LEDC governments will need to cooperate for the success of this issue; however, not all should be left in the hands of LEDC governments, as they usually have limited funding to allocate, little expertise to efficiently solve the problem, and are prone to corruption. It is thus a better solution not only to depend on LEDC governments to solve the problem, but to offer UN (and NGO) expertise and direct aid to areas in need.

United Nations Development Program (UNDP)

“UNDP partners with people at all levels of society to help build nations that can withstand crisis, and drive and sustain the kind of growth that improves the quality of life for everyone. On the ground in 177 countries and territories, we offer global perspective and local insight to help empower lives and build resilient nations.”⁹ (UNDP) As its name suggests, the UNDP involves itself with global development. A large and essential part of this is ensuring proper access to safe drinking water for everyone, and thus it is of utmost importance to the UNDP to invest and improve water management, consequently providing everyone with access to clean water, the most basic foundation to a nation’s development. Regarding water management, the UNDP is very much involved with water supply and sanitation, with projects such as the ‘Community Water Initiative’, ‘Every Drop Matters’ and ‘MDG GoAL-WaSH’, all focusing on:

- *“Coordination of country assistance by UN and other development partners*
- *Incorporation of water and sanitation into national development planning*
- *Governance and policy reform for enhanced water supply and sanitation access*
- *Capacity building of institutions and practitioners*
- *Special attention to fragile states, where water and sanitation challenges are greatest*
- *Local delivery of water supply and sanitation services through community-based initiatives”¹⁰*
(UNDP)

⁹ "A World of Development Experience." *Overview*. N.p., n.d. Web. 2 June 2012.
<http://www.undp.org/content/undp/en/home/operations/about_us.html>.

¹⁰"Water Supply and Sanitation." *United Nations Development Programme*. N.p., n.d. Web. 2 June 2012.
<http://www.undp.org/content/undp/en/home/ourwork/environmentandenergy/focus_areas/water_and_ocean_governance/water-supply-and-sanitation/>.

UN-Water

“UN-Water strengthens coordination and coherence among UN entities dealing with issues related to all aspects of freshwater and sanitation. This includes surface and groundwater resources, the interface between freshwater and seawater and water-related disasters.” (UN-Water)¹¹ UN-Water is thus a core organization in the elimination of inadequate water management, as it deals with all issues water-related. It is an expert organization specialized in water matters, thus is able to offer expertise as well as professional aid and advice to relevant nations. Furthermore, because it is a United Nations Organization (UNO), it is able to receive UN funding, and remains neutral politically, culturally and ethnically, which is an advantage when working with LEDCs of all continents, cultures and (economic) situations. It can thus also be considered trustworthy and the progress of its projects is easy to track and monitor.

World Health Organization (WHO)

“WHO is the directing and coordinating authority for health within the United Nations system? It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends.”¹² (WHO) This UN body is in charge of everything related to global health, and because the lack of access to clean water results first and foremost to highly increased health risks, vulnerability and diseases, the WHO is a very relevant organization in helping combat the problem of waterborne diseases as a result of the lack of access to clean water. The WHO has a specialized department focusing on water, named ‘Water, Sanitation and Health’ (WSH). The WSH aims to decrease the prevalence and burden of water/sanitation-related diseases. It hopes to achieve this through:

- *“Providing leadership in Water, Sanitation, and Hygiene related issues (by making authoritative statements, influencing policy and coordinating networks of partners and collaborating centres)*
- *Normative work (mainly on water quality, but also on monitoring approaches and interventions, usually resulting in guidelines and best practice texts)*
- *Providing evidence (through various monitoring activities, but also through commissioned research)*
- *Supporting Member States (through technical cooperation and capacity building)*
- *Responding to emergencies (the role in the Health Cluster - WASH in healthcare - and in the WASH cluster - restoring safe water supplies and adequate sanitation)*
- *Knowledge management (through analysis, synthesis and dissemination of reliable and credible*

¹¹ "Discover UN-Water." *Discover UN-Water*. N.p., n.d. Web. 2 June 2012. <<http://www.unwater.org/discover.html>>.

¹² "About WHO." *WHO*. N.p., n.d. Web. 2 June 2012. <<http://www.who.int/about/en/>>.

information)¹³ (WHO)

Timeline of Events

Below is a short summary of relevant events throughout history:

Date	Description of event
22/03/1992	The First World Water Day (<i>See Evaluation of Previous Attempts to Resolve the Issue</i>)
2002	World Summit on Sustainable Development was held in Johannesburg
11/2006 – 12/2012	Duration of the 'Every Drop Matters' Initiative (<i>See Evaluation of Previous Attempts to Resolve the Issue</i>)
30/08/2012	Access to clean water is declared a human right by the UN
29/03/12	International Conference on: 'Water Management Issues in Africa'
2013	International Water Cooperation Year

UN involvement, Relevant Resolutions, Treaties and Events

- UN Resolution 64/292 The Right to Water and Sanitation, 30 September 2010 ([A/RES/64/292](#))
- 2013 - International Water Cooperation Year

Evaluation of Previous Attempts to Resolve the Issue

World Water Day (22/03 Every Year)

Organized by UN-Water, this initiative aims to increase awareness of the scarcity and value of water for one day each year. *“International World Water Day is held annually on 22 March as a means of focusing attention on the importance of freshwater and advocating for the sustainable management of freshwater resources. An international day to celebrate freshwater was recommended at the 1992 United Nations Conference on Environment and Development (UNCED). The United Nations General Assembly responded by designating 22 March 1993 as the first World Water Day. Each year, World Water Day highlights a specific aspect of freshwater.”*¹⁴ (UN-Water) This on-going initiative is important to ensure that the importance of freshwater is not forgotten.

Each year, a new aspect of this issue is discussed and elaborated on; making sure the topic of clean safe water management stays high on the list of global priorities. Despite this program being very effective in raising awareness and stimulating development of potential solutions to the problem,

¹³ "About Water, Sanitation and Health." WHO. N.p., n.d. Web. 2 June 2012. <http://www.who.int/water_sanitation_health/about/en/index.html>.

¹⁴ "Activities." *Activities*. N.p., n.d. Web. 2 June 2012. <<http://www.unwater.org>>.



the initiative itself does little to directly tackle or solve the problem in LEDCs, depending solely on raising awareness and promoting its importance, hoping individuals themselves will be inspired and stimulated enough to join or start programs to solve the issue.

Every Drop Matters (EDM)

UNDP and The Coca-Cola company partnered together to create EDM, a water initiative. This project aims to support the achievement of the Millennium goals regarding improving access to safe water and sanitation, key to economic and social development of nations. The EDM works in 20 countries, under the support of the UNDP Water Governance Program and with the foundation of the Eurasia and Africa Group of the Coca-Cola Company. Together, they are able to form a solid foundation for development, branching out to cover sub-themes and topics related to water access, such as adaptation to climate change and access to environmental services in rural areas of LEDCs. This Initiative aims to achieve its goals by offering, at a regional level:

- *“Improved Access to Safe Drinking Water*
- *Improved regional and industrial water management*
- *Advocacy and communication¹⁵”*

This initiative has been relatively successful, because its goal is specific, concrete and its methods of obtaining the goal are clear-cut and straightforward. The collaboration between the UNDP and The Coca-Cola Company is also extremely valuable, as there is much expertise and experience that private corporations can provide to non-profit organizations such as the UNDP. Furthermore, this collaboration emphasizes the importance of including not only NGOs and UNOs in the attempt to solve the issue, but also relevant private transnational companies, holding much power, leverage and knowledge of a different kind, such as The Coca-Cola Company. Not only does this take part of the monetary funding pressure off the UN, but it also provides a valuable cooperation and fusion of knowledge, influence and ideas.

Possible Solutions

Raising Awareness/Education

Because of lack of education being a leading cause of the severity of this issue, a core short-term and long-term solution to the problem is education and raising awareness. This must be done in both MEDCs and LEDCs; however, the emphasis should, of course, be in LEDCs. With the proper knowledge of simple water purification techniques (a lot of which are low-cost), locals in LEDCs will be able to obtain relatively clean, safe drinking water themselves, and pass this knowledge on to their community. This is sustainable development as it teaches people a knowledge and skill as opposed to sending them the

¹⁵ "REGIONAL WATER PARTNERSHIP INITIATIVE:"EVERY DROP MATTERS"" UNDP. N.p., n.d. Web. 2 June 2012. <<http://www.undp.org.tr/Gozlem2.aspx?WebSayfaNo=667>>.

product they need, but leaving no long-term impact to the society after the product is used up. Regarding MEDCs, appropriate awareness needs also to be raised about the water management problems LEDCs face, as this would act as an incentive for people to stop wasting as much water and resources in MEDCs, which would in the long-term decrease the huge water consumption of such countries, eventually making water less scarce and consequently more available to LEDCs.

Appropriate Aid

It is important that the appropriate type of aid is given to LEDCs in need of better water management. This aid should take into consideration the alleged corruption in many LEDC nations, which often leads to the unfair distribution of wealth, resources, and most importantly, water and food. Thus, giving monetary aid to governments wouldn't be the most effective type of aid, as there is no guarantee the money will be used appropriately and effectively. Furthermore, it is always important to remember that aid should not be a long-term solution, and any type of aid that would require long-term commitment with no long-term effects is less effective than a short period of aid with lasting effects on a community, to ensure long-term independent development.

Regulation

Water management requires constant regulation. Often, the abundance of water makes the quantity of clean water not the problem. The problem often lies in the unfair distribution of water. To ensure that the availability of clean water is prioritized and made as efficient as possible, constant regulation and monitoring of water uses and distribution is vital, especially in LEDC nations where supply of water is limited and government corruption is prevalent. Thus, this regulation should be performed by a neutral, trustworthy body, such as an UN organ. However, introducing this as a possible solution is also risky, as it is arguably infringing on national sovereignty.

Improving Irrigation

Water management is also related to water transportation and efficiency. In many LEDCs, the lack of proper water transportation makes it hard to allocate clean water to many areas of the country, especially rural ones. Even if irrigation and transportation are available, it is likely highly inefficient, polluting the water as it is being transported or losing much of the water on the way. Thus, a huge improvement would be to install better irrigation systems in such nations, so that water can be distributed efficiently, effectively and speedily throughout the nation. This also makes water management easier as less water is wasted on the journey to an area and the accessibility to all areas in the countries is increased.

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Appendix or Appendices

- I. http://en.wikipedia.org/wiki/LEDC#List_of_emerging_and_developing_economies
List of the categorization of LEDCs can be found here:
- II. http://en.wikipedia.org/wiki/MEDC#Human_Development_Index
Lists of the categorization of MEDCs can be found here:
- III. <http://daccess-ods.un.org/TMP/8850696.68292999.html>
UN Resolution 64/292. The human right to water and sanitation
- IV. http://www.who.int/water_sanitation_health/publications/glaas_report_2012/en/index.html
Global analysis and assessment of sanitation and drinking-water (GLAAS). This document presents relevant data collected by the WHO in 74 developing countries regarding meeting the Millennium Development Goals and all issues water-related.