

The Problems

- although Africa is the continent least responsible for climate change, it is particularly vulnerable to the effects (Africa Partnership Forum)
 - rising global temperature accompanying climate change have intensified the hydrological cycle leaning to dryer season
 - especially in the very south and very north of Africa
 - increases the risk of more extreme and frequent droughts
- **sub-Saharan Africa has the largest number of water-stressed countries of any region**
- water scarcity
 - lack of enough water (quantity) or lack of access to safe water (quantity)
 - both a natural and man made phenomenon
 - when annual water supplies drop below 1,700 cubic meters per person
 - economic scarcity
 - finding a reliable source of safe water is time consuming and expensive
 - population doesn't have the necessary monetary means to utilize an adequate source of water
 - most disturbing form of water scarcity
 - due to lack of compassion and good governance
 - unequal distribution of resources due to political and ethnic conflict amongst other things
 - e.g. much of sub-Saharan Africa
 - physical scarcity
 - lack of water is the most profound problem
 - demand outstrips the land's ability to provide the needed water
 - most often associated with dry parts of arid regions
 - increasing number of regions where it's a man made condition
 - e.g. Colorado river, US
- absolute scarcity
 - below 500 cubic meters annually per person
- the **water poverty trap**
 - developed by economists specifically observing sub-Saharan Africa
 - refers to the cycle of financial poverty, low agricultural production, and increasing environmental degradation
 - creates a link between the lack of water resources with the lack of financial resources
 - affects societal levels: individual, household, community
 - people are subjected to low incomes, high fixed costs of water supply facilities, and lack of credit for water investments
 - results:
 - low level of investment in water and land resources
 - lack of investment in profit generating activities
 - resource degradation
 - chronic poverty
 - people typically pay 5 - 10 times more per unit of water than people with access to piped water
 - due to lack of infrastructure and government corruption
 - price raise of water services from 10 - 30%
- women and girls walk miles at a time to gather from streams and ponds full of water borne diseases

RESEARCH: Africa's Water Crisis: What The World Doesn't Want To Know

- almost 2/3 (64%) of households rely on women to get the family's water when there is no water source in the home
- girls under the age of 15 are twice as likely to be responsible for this
- the *jerry can*, the average container for water collection, weighs over 40 pounds when full, up to 44 when using pots, some even 70 lb barrels
- up to 6 hours a day fetching water
- **result: permanent skeletal damage**
- hunger
 - **lack of water causes many Africans to use wastewater for crop growth**
 - results in people consuming foods that can contain chemicals and disease causing organisms transferred by the wastewater
- **there is no global target to improve hygiene**
- lost school and work days
 - poor health leads to poor productivity
- **the most immediately apparent impact of water scarcity is health**
 - with complete lack of water, humans can live from 3 - 5 days on average
 - results to turning to unsafe water sources
 - contributes to the spread of water borne diseases
- water borne diseases
 - e.g. typhoid fever, cholera, diarrhea, stomach pains, **dysentery, malaria, dengue fever**
 - infants and young children are especially susceptible because their immune systems are experiencing everything for the first time **resulting in a high mortality rate for them, especially in many African regions**
 - 1 person sick, 1 person to care for them
 - need money if medicine is needed instead of being for food or school supplies
 - **can lead to diseases like trachoma, plague, and typhus**
 - the **storing of water** due to shortages increases the risk for illnesses carried by mosquitoes, specifically malaria and dengue fever
 - although preventable and treatable, they still are one of the leading causes of disease and death
 - doesn't happen to developed country because of water treatment systems that filter and chlorinate water
- death
 - **one child dies every 21 seconds from a water related disease**
 - **diseases from unsafe water and lack of basic sanitation kill more people very year than all forms of violence, including war**
 - **the preventable part of these diseases kill more than 5 M people per year**
- **water related disasters are the most economically and socially destructive of all natural disasters**

Statistics

WORLDWIDE...

- UN suggests each person needs 5-13 gallons of water per day for drinking, cooking and cleaning
- 827.6 M live in slums, lacking adequate water and sanitation services
- 1 in 9 people worldwide don't have access to safe & clean drinking water
- 1 in 3 (2.5 B) don't have access to adequate sanitation
 - only 67% has access to sanitation
- 443 M school days lost every year due to water related sickness
- 1/2 of the people in hospitals are suffering from water related disease

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- diarrhea is the leading cause of illness and death
 - 30,000 deaths per week due to unsafe water and unhygienic living conditions, 88% of the deaths are due to this
 - 90% children under 5 years old
- 80% of illnesses in developing countries are linked to poor water and sanitation conditions
- over 1/2 of primary schools don't have access to water and sanitation facilities
 - no toilets: girls drop out at puberty
 - only 50 % of girls are enrolled in schools because of this
- nearly 1 B people in developing countries don't have access to it
- 84% of the people who don't have access to clean water live in rural areas where the principal subsistence is agriculture
- approximately 3.5 M die due to inadequate water, supply, sanitation and hygiene
- 90% of wastewater in developing countries flow untreated to rivers, lakes, and highly productive coastal zones
 - threaten health, food security and access to safe drinking and bathing water
- between 1970 - 2000, populations of freshwater species declined by 55%
 - freshwater holds more than 10% of all life on the planet
 - 35% of all vertebrates supporting terrestrial biodiversity
 - compromise ecosystems and all the services they deliver like supply of clean water
- many of the most profound and immediate impacts of climate change relate to water
 - > 2B people affected by drought more than other physical hazard
 - since 1900, more than 11 M people have died as a consequence

IN AFRICA...

- 1 in 5 deaths under the age of 5 due to dirty water
- **unclean water and poor sanitation are the world's second biggest killer of children**
- 783 M (1 in 9) people don't have access to clean water
 - 37% live in sub-Saharan Africa
- < 1 in 3 people have access to a proper toilet
 - 24% rural, 44% urban population have access to sanitation facilities
- 40 B hours lost per year collecting water, up to 6 hours per day
 - a year's labor in France
- **Water Supply and Sanitation Collaborative Council (WSSCC) estimates that treatment of diarrhea due to water contamination consumes 12% of the health budget**
- according to Human Development Report, the use of water is mainly for irrigation and agriculture
 - accounts for more than 80% of water consumption
 - it takes about 3,500 liters to produce enough food for the daily minimum of 3,000 calories
 - food production for a family of 4 takes a daily amount of water in an olympic sized swimming pool
 - 80 - 90% of all families in rural Africa rely upon producing their own food
 - **water scarcity means loss of food security**
- countries:
 - Benin, girls ages 6 - 14 spend 1 hour average collecting water, 25 minutes for their brothers
 - Malawi, there are complex seasonal factors but women consistently spend 4 to 5 times longer than men

- Tanzania, school attendance 12% higher for girls in homes located 15 minutes or less from a water source while boys' attendance are far less affected by this distance
- Senegal, over half of 5,000 schools have no water supply, and almost half have no water sanitation facilities
 - half of that half had separate facilities for boys and girls
 - because girls avoid using the restroom or dirty water consumption, they are dehydrated and unable to concentrate

Millennium Development Goals

- MDG 1: Access to water for domestic and productive uses (agriculture, industry, and other economic activities) has a direct impact on poverty and food security.
- MDG 2: Incidence of catastrophic but often recurrent events, such as droughts, interrupts educational attainment.
- MDG 3: Access to water, in particular in conditions of scarce resources, has important gender related implications, which affects the social and economic capital of women in terms of leadership, earnings and networking opportunities.
- MDGs 4 and 5: Equitable, reliable water resources management programs reduce poor people's vulnerability to shocks, which in turn gives them more secure and fruitful livelihoods to draw upon in caring for their children.
- MDG 6: Access to water, and improved water and wastewater management in human settlements, reduce transmission risks of mosquito-borne illnesses, such as malaria and dengue fever.
- MDG 7: Adequate treatment of wastewater contributes to less pressure on freshwater resources, helping to protect human and environmental health.
- MDG 8: Water scarcity increasingly calls for strengthened international cooperation in the fields of technologies for enhanced water productivity, financing opportunities, and an improved environment to share the benefits of scarce water management.

What's being done?

- donations to create drilled wells, weirs (sub-surface sand dams) and rain catchment systems
 - weirs are for very dry places where seasonal water flows can be captured and stored
 - traps rainwater on the few rainy days and over time, ground water levels rise
 - collect or store water for drinking
 - leftover water seeps into the ground and creates more fertile fields
- sanitation facilities & hygiene training
- spring protection
- some non-profit organizations focused on the aspect of drinking water contamination from sewage waste
 - install cost-effective and relatively maintenance-free toilets
- some focus on innovative pump systems built to aid communities in drawing clean water from wells
 - basic and simple to repair
 - replacement parts easily found

Joint Monitoring Program for Water Supply and Sanitation

- setup by the World Health Organization (WHO) and United Nations Children's Fund (UNICEF)
- tasked in monitoring progress toward the Millennium Development Goal Target 7c
 - "halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation"
 - 2 indicators:
 - proportion of population using an improved drinking water source
 - one that is likely to be protected from outside contamination, especially by fecal matter
 - proportion of population using an improved sanitation facility
 - one that is likely to hygienically separate human excreta from human contact
 - said to have been accomplished by 2012
- *hydrologists* assess water scarcity by looking at a population equation
 - 1,700 cubic meters per person as a national threshold for meeting water requirements for agricultural and industrial production, energy, and the environment
 - 1,000 cubic meters represents the state of water scarcity
 - < 500 cubic meters represents the state of absolute scarcity
- as of 2006, **the sub-Saharan Africa has the largest number of water-stressed countries**
 - of the 800 M total population, 300 M are estimated to live in a water stressed environment
- For more information: http://www.wssinfo.org/documents/?tx_displaycontroller%5Bregion%5D=16&tx_displaycontroller%5Bsearch_word%5D=&tx_displaycontroller%5Btype%5D=country_files

United Nations Economic Commission for Africa

- emphasizes the need to invest in the development of Africa's potential water resources
 - reduces unnecessary suffering, ensure food security, protect economic gains
 - done by effectively managing droughts, floods, and desertification
- include emphasis on infrastructural implementations and improvement of wells, rainwater catchment systems, and clean water storage tanks

African Water Week by African Ministers' Council on Water (AMCOW)

- placing water at the heart of the post-2015 development agenda
 - water, sanitation, hygiene
 - water resources management for sustainable development
 - wastewater management and water quality
 - water and disaster risk management

African Water Facility by AMCOW

- multilateral fund that provides grants and technical assistance to enable governments, NGOs and private-public partnerships to secure investments and implement sustainable water projects throughout Africa
 - project preparation
 - water governance

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- water knowledge
- missions:
 - contributing to the improvePhoyment of water resources governance
 - increasing water wisdom
 - meeting urgent needs
 - strengthening the financial base for the desired future'
- values:
 - environmental and social sustainability
 - promoting innovation
 - building and maintaing a close relationship with its guarantees throughout the entire duration of a project
 - promoting knowledge exchange and collaboration
 - excellence
 - fostering partnerships between all water stakeholders
 - improving lives and livelihoods
- overall aim: leverage all 3 to provide the framework and conditions necessary for sustainable projects to succeed and for the African water sector to thrive
- aim at building resilience to climate change and promoting the reduction of greenhouse gas emissions
 - overcome the new water-related challenges presented by climate change
 - reduce pollution causing global warming
 - prioritizes projects that feature water harvesting, conservation, storage, recycling and re-use, and the use of renewable energy to power water stations and infrastructure
 - use of low-carbon energy for power generation to reduce emissions that contribute to global warming, or absorb carbon dioxide
 - promoting green energy using renewable energy (wind, solar, hydro etc.) for power generation
 - promoting reforestation to prevent land degradation, promote water retention, and absorb carbon dioxide
- projects are properly screened for environmental and social risks
- projects with components designed to deliver special benefits to women, youth and disadvantaged or marginalized communities
 - promotes social equity and economic integration
 - essential to sustain economic growth
 - knowledge transfer or income development
 - making provision to allow them to participate in project planning
 - involved in the implementation of projects whenever possible
- grants from €50,000 to €5,000,000
 - product design and small scale pilot projects
- claim to have impacted 29 M people across Africa
- each € contributed attracts €35 more
 - initial investment of 23.7 M
 - committed 839 M
 - pledged 1.4 B
 - goal by 2020: 2.5 B

Water for Life 'Decade' by UN

- DMC goal in 10 years, from 2005 - 2015
- target set for the region is 75% coverage
 - North Africa has 92% coverage, well on its way to meet the goal of 94%
 - sub-Saharan Africa only has 40%, water coverage goal of 61%

- driving forces and pressures:
 - population growth and rural-urban migration
 - economic development and poverty
 - half of the sub-Saharan population lives on less than a dollar a day
 - 2/3 of its countries rank among the lowest in the Human Development Index
- problems:
 - insufficient domestic funding
 - lack of coordination
 - unclear definition of roles and responsibilities
 - lack of harmonization of laws and policies related to environmental management
 - inadequate staffing
 - varied climate and natural hazards
 - frequent floods and droughts
 - destroys economic livelihood and farmers food sources
- **the state of sanitation remains a powerful indicator of the state of human development in any community**
 - the method of excrement disposal is one of the main indicators
 - reduces overall child mortality by 1/3
- gender mainstreaming
 - assessing the implications for women and men of any planned action
 - making the concerns of both men and women integral so they benefit equally
- green economy
 - emphasis on the pursuit of opportunities to invest in sectors that rely upon and use natural resources and ecosystem services
 - an economy that improves human well-being, lessens inequality, reduces environmental risks and ecological scarcities
 - agriculture: achievement of food security by using less natural resources
 - improved water management, substantial investments and innovations
 - increasing crops that ensure a higher nutrition per drop of water
 - cities: reduce spatial footprint by development and shared infrastructure reducing emissions and resource use
 - reduce dependency on transportation and infrastructure
 - provide basic services with greater efficiency
 - ecosystem services: valuable, less visible, non-monetized benefits of conserving ecosystems
 - to recover sustainable growth, fairness, water security, and poverty reduction while improving and protecting natural assets
 - green jobs: public and private investments that reduce carbon emissions and pollution
 - enhance energy and resource efficiency
 - prevent loss of biodiversity and ecosystem services
 - industry: making water prices more sustainable
 - address overexploitation and contamination
 - improve water infrastructure and management
 - goal is *zero discharge*
 - water and sanitation: provision of water sanitation services to the poor

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- reducing the distance to water source from 30 to 15 minutes increase girls' school attendance by 12%
- access to sanitation, the practice of good hygiene and safe water supply could save 1.5 M children every year
- clean water can reduce water related deaths by 21%, sanitation by 37%, hand washing by 35%
- according to WHO, for every dollar invested in water and sanitation, the economic return is between \$3 - \$34

Predicted Effects

- becomes a less immediate concern, the country moves forward
 - students return to class, especially the girls
 - every 10% increase in women's literacy, the country's economy can grow up to .3%
 - improved school attendance + good grades = better chance at obtaining work
- better food security, reduced hunger
 - less crop loss
 - schools feeding students with gardens to reduce cost
 - women who don't need to fetch water can help growing food
 - can increase yields from 20 - 30 %
 - can lift 150 M people out of hunger
- healthier bodies
 - time lost to sickness is reduced
 - people work, lift themselves out of poverty
- gain 413 M days of health
- reduce conflict over water access, especially clean water
 - 276 transboundary river basins
 - 256 (92.7%) are shared by 2 - 4 countries
 - 20 (7.2%) shared by 5 or more
 - 0.1 % Danube river basin shared by 18 countries
 - separated into 4 regions: Nile, Niger, Zambezi, Volta basins
- even the most hostile enemies have a capacity for cooperation on water
 - potential to create spillover benefits
 - e.g. Nile Basin Initiative between Egypt and sub-Saharan Africa
- by 2025, 1.8 B people will be living in countries or regions with absolute water scarcity
 - 2/3 of the world's population could be living under water stressed conditions
- by 2030, 1/2 of the world's population will be living in areas of high water stress
 - between 75 to 250 M in Africa
 - in arid and semi-arid places it'll be between 24 to 700 M people

Future Facts

- agriculture accounts for roughly 70% of global freshwater withdrawals
 - 19% increase in agricultural water consumption by 2050
 - population increase will require 60% more food
- between 2006 and 2030, there will be a 44% increase in demand for energy in the treatment of waste water
 - yearly, the industry dumps 300 - 400 metric tons of polluted waste water
- by 2030, 75 - 250 M people in Africa will be living in areas of high water stress
 - displace 24 - 700 M people as conditions become increasingly unlivable

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- on the 2012 conference on 'Water Scarcity in Africa: Issues and Challenges'
- current rates of consumption + climatic stress = levels of water scarcity are to reach dangerously high levels by 2025 (UNECA)
 - by 2022, there is a potential for shift in water scarcity's potential to contribute to armed conflict
 - based on National Intelligence Estimate (2011), after 2022 water will be more likely used to be used as a weapon of war and potential tool for terrorism especially in North Africa
- **World Economic Forum 2011 has included water as one of the world's top 5 risks for the first time**
- by 2035, energy consumption will increase by 50% resulting to an increase of 85% percent in energy consumption for cleaning water
- by 2050, the global water demand for water withdrawal will increase by 55%

SITES FOR THE READER

- <https://thewaterproject.org/getinvolved>
- <http://www.waterforafrica.org.uk/help-us>
- <http://www.waterforafrica.com.au/sponsorship/>
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