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Mongolia, Factor 9: Water & Sanitation

## **Mongolia: Improving Health and Food Security through Water Accessibility and Sanitation**

### **1. Overview**

Mongolia is a nation caught between its past nomadic history and its future as a mining powerhouse. It is characterized by diverse geography which includes the Gobi Desert, vast semidesert plains, grassy steppes, and various mountain chains. On the same lands where herders once thrived, a lush variety of natural resources can be found: oil, copper, coal, tin, nickel, gold, silver, and iron ("East & Southeast Asia: Mongolia"). Once a nation comprised of entirely of nomadic herders and once under the thumb of the Soviet Union, Mongolia's heavy industry is finally beginning to bloom. Mongolia's economy in response is growing at a fast pace, often hitting double digits. However, despite Mongolia's abundant resources, it is severely lacking one crucial ingredient to success: water. Mongolia is a landlocked country with little freshwater resources to spare between industrial, agricultural, and domestic uses. Currently in Mongolia, the urban poor are losing this tug-of-war over water resources as many urban families do not even have the access to clean water year-round and sophisticated sanitation that is required for sustained health and food security. Therefore, Mongolia needs to implement strategies to improve water and sanitation accessibility by focusing on the needs of the people: providing infrastructure, multi-service water kiosks, and ecological sanitation.

### **2.. Increasing Urbanization**

Despite Mongolia's bright future in heavy industry, it is disconcerting to recall that the livestock population of 45 million greatly outnumbers the human population of 3 million by over 30 livestock per person (Zoljargal, 2015). Due to harsh climates and unsuitable land, only about one percent of Mongolia's land area is arable. Thus, animal husbandry has played a dominant economic role for centuries and continues to do so today; herding accounts for four-fifths the value of agricultural production ("Mongolia"). However, agriculture accounts for only 16.3% of the GDP in comparison to industry's 33.4% . In spite of agriculture's decreasing significance in modern Mongolian economy, the labor force paradoxically is a third agricultural and only a tenth industrial ("East & Southeast Asia: Mongolia"). These numbers can have huge repercussions as more and more herders are moving to urban areas due to a variety of reasons.

Climate change is an enormous factor. Due to desertification, which affects 77% of Mongolia's territory, and overgrazing, many herders are losing valuable pastoral land needed to support their animals (Zoljargal, 2013). In fact, "the United Nations Development Programme estimates that up to 90% of the country is now fragile dryland" (Gillet). Additionally, heavy winter conditions in Mongolia known as "dzud", meaning "white death", are also contributing to migration as some herders have reported losses ranging from 50-70% of their livestock from the last dzud of 2010. Overall, millions of animals were lost, though in addition to aforementioned environmental push factors, many herders are also moving to the city for pull factors: hopes of accessing better healthcare, education, and economic opportunities (Dettoni).

Although Mongolia is known for its low population density, ironically, about 50% of Mongolia's population lives in the capital city of Ulaanbaatar. This number is expected to increase at a rate of about 9% each year as the rural poor struggle to survive in their traditional livelihood of herding or decide to move in search of opportunities (Norovsambuu). As a result, large unplanned settlements have developed all over the city. These settlements are nicknamed "ger districts" due to the lack of affordable housing available such that migrants are forced to live in these areas in gers, a traditional form of mobile housing

comprised of large felt tents. Furthermore, Mongolia is unique in that nationals are able to obtain legal ownership over unused land. Even though these settlements are legal, the migrants, who comprise more than half of Ulaanbaatar's population of 1.2 million, share the lack of basic public services with many residents of illegal settlements all around the world (Norovsambuu).

### **3. Typical Urban Family**

The typical urban family in Ulaanbaatar is a migrant nuclear family comprised of about four members living in a ger according to a 2010 population census ("Mongolia Has Launched"). Ger families have fewer job opportunities and lower pay than families in the inner city due to the lack of skill training for high-paying jobs with specific qualifications. Therefore, many migrant families are unemployed or are forced to work in informal jobs with low wages (Theunissen). The unemployment rate in these districts is 62% compared to 21% in the more developed areas of Ulaanbaatar (Gillet). Female-headed households are among the most vulnerable groups prone to poverty in these ger districts; according to data from 1998, 47.1% of urban female-headed households are poor (Burn). This number has certainly increased because in 2002, more than 55,000 households were headed by women, a 250% increase from statistics in 1990; at least half of these households are poor ("Rural Poverty in Mongolia"). Additionally, women are underrepresented in high-growth industrial jobs, managerial positions, and entrepreneurial activities; "within small and medium enterprises the share of women entrepreneurs ranged from 20 per cent in industry to 25 per cent in trade and 35 per cent in the service sector as a whole" (Burn). Therefore, female-headed households are continuing to succumb into poverty and are not able to find employment in Mongolia's burgeoning economy.

The urban poor lack easy accessibility to water, food, schools, sanitation, heating, health care, and electricity due their location on the outskirts of the city and due to weak infrastructure. Therefore, they usually must pay more for those services than inner city residents. These poor economic conditions can have serious repercussions on food security. According to a 2007 study by the Food and Agriculture Organization, the lack of purchasing power found in the urban poor contributes to food insecurity ("Joint Food Assessment"). The urban poor cannot afford to consume meat or milk, traditional staples of the Mongolia diet, and instead rely on flour products, vegetables, and potatoes. Their access to food is also capricious with many families resorting to skipping meals and sometimes not eating at all for days at a time ("Joint Food Assessment").

### **4. Current Water Accessibility: Water Kiosks**

But the most troubling aspect is the lack of access to clean water. Considering that Ulaanbaatar is expected to face a water shortage as early as the year 2015, the issue of water accessibility becomes an urgent priority (Theunissen). According to a 2005 UNICEF/NSO survey, "water supply is the largest common problem for all survey sites and for all kinds of groups- men, women and mixed" ("Joint Food Security"). The sources for drinking water in ger districts are located at an average distance of 3.5 km so residents have little choice but to get their water from kiosks that come on trucks, especially during the winter time where temperature can drop below freezing ("Urban Poverty Profile"). Currently about 500 water kiosks, managed by the city, exist with half connected to the main water pipeline and the other half supplied by tankers. Additionally, the water kiosks are not very cost effective due to high operation costs (Patinet). However, even then, 20% of household populations still indicated that water availability is still poor at these kiosks. One possible reason is cost; ger residents must pay 2-4 times as much higher rates than people who live in the city due to distance ("Urban Poverty Profile"). These high costs have hindered water accessibility by the urban poor as apartment dwellers consume 240-450 liters of water per day while ger residents only consume a measly 8-10 liters in comparison ("Joint Food Security"). These high water costs will also significantly hinder accessibility to purchase food and health care due to the importance of water in daily life.

## **5. Solutions for Better Water Accessibility: Better Roads & Multi-Service Kiosks**

It is necessary to insure that all people have access to clean, drinkable water for years to come. This is an important Millennium Development Goal set for Mongolia. The first step to achieve that goal is to develop better infrastructure for the urban poor in Mongolia. Due to the distance and weak infrastructure of the ger districts from the inner city, water is more expensive. Roads are described as “simple, unpaved mud paths and streets have no signs, streetlights or even names but are merely the gaps naturally placed between two rows of tents or shacks set up by newly arrived migrants without any input from the government” (Gillet). In the winter, the absence of proper roads makes the water kiosk transportation system “complicated and dangerous, especially those to transport water” (Patinet). Therefore, good investment in roads by the city of Ulaanbaatar would not only benefit water availability by reducing the cost of operation, hopefully lowering the water price for many families, but also benefit economic activity in the ger district. “One of the biggest problems is that there is very little economic activity within the *ger* districts due to inadequate infrastructure – everyone has to leave the area to work” (Gillet). According to a study conducted on a survey of Indonesia’s highways, high road quality is correlated to improvements in household income and consumption; roads also create job creation in the manufacturing sector (Gertler). These effects could easily be replicated in Ulaanbaatar’s ger districts. In conclusion, roads will provide more water accessibility by lowering operating costs for kiosks, thus lowering water costs for families. They will also provide manufacturing jobs and easier accessibility to jobs in the inner city. Ultimately all of these factors will increase the typical family’s food security by increasing purchasing power.

Another factor in increasing water accessibility is the establishment of multi-service kiosks instead of traditional water kiosks. As stated before, the water kiosks are managed by the city but are not cost effective. A multi-service kiosk, first designed by the ACF (Action Against Hunger), entails the renting of spaces within the kiosk to other businesses with occupations such as hairdresser, launderette, and seamstress (Patinet). These additional services will support the running costs of the kiosk--particularly, heating, a big financial burden in current kiosks today. Such a kiosk was built in the Altan Ovoo area, Songinokhairkhan District (a ger district) in Ulaanbaatar in 2013. This kiosk was connected to the main water pipeline which also reduced delivery costs and increased the quality of water sold (“A Multi-Service Water”). Unfortunately, more information regarding the status of this kiosk could not be found presently as the site for ACF Mongolia seems to be under construction. However, the effects of similar multi-service water kiosks can be observed elsewhere in the developing world. In Zambia, multi-service water kiosks have been a huge success. They have provided one million Zambians with access to clean water and vital information about disease, health, and safety on bulletins (“Case Study”). These kiosks also provide health products such as condoms and soap and everyday groceries. These services can easily be adapted to Mongolia’s multi-service water kiosks. Additionally, around 50% of Zambia’s kiosk operators are women due to deliberate preference which can help alleviate employment struggles that poor female-headed households face.

However, in order to turn these multi-service kiosks into success, the community and various organizations need to coordinate successfully together. According to the Zambia study, the system of water kiosks needs to be managed by a formal water service provider (preferably an NGO), contracted operators, and peri-urban units of the service provider who then supervise the contracted operators through visits every two weeks. The operators need to be paid through monthly meter readings and receive a commission for every cubic meter of water sold (“Case Study”). Accountability and communication between the operator, the peri-urban unit, and the formal water service provider are essential for economic success.

## **6. Current Sanitation Accessibility: Pit Latrines**

For urban areas, only 65.3% of the population has access to improved sanitation (“East & Southeast Asia: Mongolia”). There is no plumbing in ger districts and people rely on outdoor latrines which can be of poor quality; in 2003, “59 % of pit latrines and 54 % of soak pits in the Ger district did not meet the

hygienic requirements and 14 % and 34 % respectively of the total households in Ger district, did not have a pit latrine or soak pit” (“Water and Sanitation”). The problem with poor sanitation, especially with regard to pit latrines, is the fear that freshwater resources could be contaminated which can have serious repercussions for health in ger districts. Although some health hazards from poor sanitation are diminished by freezing temperatures in the winter, during the spring snowmelt, there have been noticeable increases in morbidity, especially regarding stomach related diseases (“Water and Sanitation”). According to the United Nations Environment Programme (UNEP), in 2002, Mongolia had 100 to 200 water disease related deaths per 100,000 inhabitants (Nellemann). This number, which was represented in a visual map, is one of the highest in all of Asia. Lastly, there is the need of comfort in toilet design in order to improve accessibility. Pit latrines are very uncomfortable, smell, and are considered somewhat undignified (“Joint Food Security”).

Currently, a full-blown central sewage system in the ger districts is too expensive and too disruptive to be feasible. Not only does the sewage system consume vast amounts of precious water, it is also very wasteful; the United Nations Environmental Programme estimates that 90% of all wastewater in developing countries is untreated and discharged straight to waterways (Nellemann). Furthermore, emissions of methane and nitrous oxide, strong contributors to global warming, from wastewater is expected “rise by 50 per cent and 25 per cent respectively between 1990 and 2020” (Nellemann). Therefore, a sewage system requires much planning and additional commodities such as wastewater treatment plants or else Mongolia’s environment could be severely damaged. However, this level of urban planning and expense is beyond the government of Mongolia’s capabilities right now due to corruption typical of developing nations. Additionally, a sewage system is difficult in countries with extremely cold climates such as Mongolia due to freezing in the pipes.

Another potential solution is relocation. The city of Ulaanbaatar has tried relocating the residents of the ger districts into the city through a combination of “construction developments and cheap mortgages” (Dettoni). However, these relocation programs have failed because of several factors: most ger residents simply could not afford relocation into the inner city and the initiative “failed to recognize the value of social and economic networks” (Dettoni). Even with the option of moving into apartments in the inner city, some ger residents prefer to stay in their gers where they have spent their entire lives; “the idea of living in walled, permanent apartments still raises eyebrows” (Dettoni). Therefore, a solution must incorporate the needs and comfort of the people at the present instead of ambitious and costly plans in the distant future. The urban development specialist for the Asian Development Bank agrees, stating that “When you upgrade poor urban areas, the best approach is to redevelop on site engaging with local communities, because their network is there, as opposed to force people to move away” (Dettoni).

## **7. Solutions for Better Sanitation Accessibility : EcoSan Toilets**

A water-effective, comfortable, and inexpensive solution needs to be implemented in ger districts. Enter, ecological sanitation or “EcoSan”. The EcoSan uses a bucket latrine design in a toilet building that separates urine from feces in separate specialized containers for waste collection in the building (Lindblom). Therefore, groundwater reserves are undoubtedly protected from contamination which reduces mortality from water diseases. Additionally, this system is very water-effective as it does not need water to flush or clean which is invaluable due to the water shortage crisis in Ulaanbaatar. After using this latrine, smells and flies are warded away using ash or dry soil which helps reduce odor and encourages the compost of the waste products (“Manual on Low”). Another major benefit of this system is the potential for fertilizer from the waste products through “proper management and storage” (“Manual on Low”). Urine and excrement contain large amounts of nitrogen, phosphorus, and potassium that are invaluable to agriculture; surprisingly, urine has actually more nutrients than that of excrement (Lindblom). According to the ACF, there is a large demand for soil compost and fertilizer in Ulaanbaatar and in the whole of Mongolia due to it being “a rare resource imported at a prohibitive price” (Patinet). Initially, attempts to introduce the EcoSan were skeptical due to the belief that residents lack the

appreciation for compost--a rarity in Mongolian culture ("Manual on Low"). However, in a recent study by the ACF in 2012, almost half of residents surveyed were interested in using the compost for agriculture (Patinet).

Special adaptations to the traditional EcoSan would have to be taken into consideration for Mongolia. EcoSan models without the use of piping should be used as extreme winter temperatures would freeze the pipes. Additionally, various EcoSan designs have incorporated comfort by implementing a Styrofoam toilet seat (for cold temperatures) which is an almost universally preferred alternative to squatting (Lindblom). According to a manual published by the City of Ulaanbaatar, the cost for building an EcoSan is estimated to be 130-250 USD.

"However, most of the construction materials required are available from scrap materials within the dwellings and therefore, in many occasions, the actual cash requirement for construction of this latrine is minimal. The cost of this latrine is low in comparison with tropical countries since the pits for this latrine in Mongolia needs to be built below the ground like other latrines. The raised latrine with steps are not acceptable in Mongolian culture since people think that during winter, steps with frozen snow will be difficult to walk and children may fall down" ("Manual on Low").

Fifty households living a ger district with high sanitation problems, implemented the EcoSan in a two-year long project ("MonEcoSan"). These toilets were provided through micro-mortgages and households that failed to maintain/operate their EcoSan lost both the toilet and the deposit. A waste collection business was developed in the private sector which created new jobs local to ger districts ("MonEcoSan"). This collection business took advantage of the fact that not everybody wants to reuse their own waste as compost. Methods to process and reuse waste by the business were developed with the support of the Mongolian State University of Agriculture ("MonEcoSan"). A key part of the project was that moderation, implementation, and training were managed by monks from the Gandan Monastery who believed in the Buddhist responsibility of taking care of the environment and community. The developers of the project believe this spiritual and communal factor is critical for a future solution involving EcoSan ("MonEcoSan").

## **8. Conclusions**

In spite of Mongolia's reputation as "Minegolia" and dazzling dreams of future wealth in resources, the government needs to focus on the concurrent needs of its expanding urban population of migrants living in ger districts. These migrants are often people who have lost their traditional livelihoods of herding by desertification, which will be worsened by climate change in the upcoming years, and horrific winter conditions. The living conditions in Mongolia's ger districts are shameful and lacking the most basic human commodities of water and sanitation, affecting migrants' ability to gain, food, education, employment, and good health. Insuring water accessibility for all means improving road infrastructure and incorporating multi-service water kiosks; these solutions will also create jobs and easier accessibility to jobs. Insuring sanitation for all means investing in smart ecological sanitation that is environmentally and economically effective and comfortable for residents; this solution will also again create jobs and boost agriculture by providing cheap fertilizer in the form of human waste product. As noticed, these solutions which merely address basic human rights also benefit industry and economy as a whole. Therefore, Mongolia needs to start investing in its people, the most valuable resource, to ensure that they are well-protected from poverty and hunger. And only then can Mongolia move forward together as a nation to a brighter future.

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