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### **Egypt: Developing the Desert into a Viable Resource**

Egypt is a country dominated by the sands that it has stood on for centuries. The country is surrounded by the large Sahara desert and the only arable land the country has surrounds the Nile River and the Nile Delta, where most of the populace is centered as well. The agriculturist once lived off of the flooding of the Nile, along with their irrigation systems, but Egypt, being one of the most populated countries in Africa and having little land to grow on, is in desperate need of new methods and practices for their food productions. With the recent revolution by the populace, food and resources are becoming scarce. Combating the hunger and poverty will take expanding the food availability and security of the large and scarcely inhabited desert that covers the country. To do this, large amounts of research and work will need to be done to create sustainable practices that may be the deciding factor of the fate of this country and as well as its population.

The average family in Egypt ranges in size from four to five members. Men and women live with their parents until they are married and a large part of religious and educational teachings happen in the home. Education is a large part of the Egyptian life, with nine out of ten Egyptian boys and girls attending primary education at the age of 14. Egyptians have 12 years of primary education and have the opportunity to pursue college, but very few complete the 12 years and hardly any actually make it to college. Almost all families live in apartments. The primary cause of this situation is the lack of land for free-standing houses. Primary foods often seen on the plates of the Egyptians are rice and bean based. Besides lunch, no meals include meats and the commonly used meats are chicken, beef, and lamb. With food being scarce, the morning and evening meals are normally leftovers from the previous meal at noon. The availability of food weighs heavily on the minds of many, with its large population and unpredictable circumstances; the average Egyptian farmer has a lot of pressure.

The Nile Delta is the only reason the population has been able to survive in this heat stricken country for so long. In ancient times, the annual flooding deposited fertile silt over the surrounding land. Over thousands of years this land has become quite fertile. This ended with the construction of the Aswan Dam. The crops depended on when, how frequent, and how significant each flood was. With only minor irrigation methods, a poor flood season could cause a drastic loss in food production for many people. Today, this is not the case. The average farmer today will grow crops such as rice, corn, wheat, and beans. The farmers no longer depend on the annual flooding as they used to because they now have more modern and efficient methods of irrigation. This has provided some stability, as well as some security within the country. Despite the new methods of irrigation, many problems have arisen for the farmers in the recent times.

One modern problem is one that farmers around the world have been dealing with for the past decade: space. The only arable soil in the country surrounds the Nile River. Despite the river being quite large and long, the area is not as large as one would imagine. The Nile River and the Nile Delta only account for 5.5% of the country's area. This area also supports 99% of the country's population. This includes ground for businesses and housing as well as farming. The small amount of arable land that the country has is being developed and anything beyond the Nile and the Nile Delta is either rocky coastline or desert. It is very difficult for the populace to even attempt to expand into the blistering sands of Egypt for the risk of

going without food and water as well. Even with their modern irrigation systems, it is considered highly expensive and nearly impossible to ever completely irrigate the entire desert. With the country growing,

but with no land to grow into, it is a large concern that the overworked available land for agriculture will either lose its fertility or will be lost to the expansion of the country.

That confronts the populace with three problems. First is the lack of innovation. The country needs to develop new methods of production and better crops that can withstand the harsh and unpredictable environment that Egypt is faced with, while still providing the necessary provisions that the country needs. The second is spreading new methods to farmers in Nile Delta, the surrounding area, and to farmers in other districts. Spreading innovated methods to current areas of agriculture will promote sustainability of the land and the current crops being grown in the area by the local agriculturists. Spreading newer methods to agriculturists attempting to cultivate and develop crops in previously unsustainable areas will help them in their efforts to continue development on new sources to feed the growing population of Egypt and increase exports, in turn creating more revenue for the country. These problems are posing many threats on the populace, but the solutions for these can spread prosperity and improvement of the lives of the people.

To confront the first problem of creating new varieties and hybrids of crops that can withstand harsh environments, produce more, are more dependable, and help sustain the current conditions of the areas that are beneficial to current agriculturists, I believe that we need to take use of one of our greatest assets: biotechnology. Biotechnology defined is: the genetic modification of a living organism for a specific purpose. Biotechnology can be used to modify a plant, animal, or microorganism for many beneficial purposes. Norman Borlaug used biotechnology through selective plant breeding to create newer, shorter varieties of plants that take less from the environment, but still produce as much or more than the original variety. This example allowed the greater production of food in many countries that were lacking in high yielding methods. Biotechnology has been beneficial in supplying nutrients to people as well. Golden Rice and Golden Rice II are engineered with high levels of beta-carotene, which our body converts into vitamin A. This product was introduced into many countries where vitamin A deficiency is a major problem. Golden Rice II contains one third of a person's daily dose of vitamin A and it has been credited as a viable solution for vitamin A deficiency. Products like these are examples of how biotechnology can change a civilization.

For Egypt, the answers also lie within biotechnology. Many biotechnology companies have been working on drought resistant corn for the past decade. If perfected, farmers in the United States and in other countries may not have to worry as much about getting that precious rain in the spring. This is considered to be a stepping stone to combating a larger problem; one that Egypt is facing themselves. If corn or other crops could be successfully engineered to have genes that allow them to grow with less water, then it is entirely possible that we could engineer these crops with a gene from a cactus or a similar plant that could grow on even less water. This is the result of one great benefit of biotechnology. Through biotechnology, a gene from any specimen can be modified into another. The gene may not always take to the new host, but it is still a possibility. This is the research being done. The geneticists' hope is that with the development of a product like this, that agriculturist in areas like the deserts of Egypt could be able to grow their crops in extraneous environments. The research being done on the development of these varieties and hybrids is extensive and rigorous, but a viable product is still far off. Development of a product like this could allow farmers in Egypt to take advantage of the large area of the country. No longer would the populace have to rely on 5.5% of its land. They could take full advantage of the whole

country, produce more, earn more, and feed more. The developments being made have already supplied the country with newer and better varieties, but the work has just begun.

Despite the possible benefits of biotechnology, the situation in Egypt on biotechnology is very controversial. In the past several years, varieties of genetically modified (GM) corn and soybeans have been planted and produced successfully. Despite the facts, the lack of resources has made it hard for farmers to take full advantage of these innovations. Egyptian agriculturist cannot afford these varieties and there has been little to no support from the country. Promotion of the newer varieties by local governments and organizations is little to none. Although Egypt is modern and is continuing to modernize, it is a country with rich roots and the changes are not made easily. The staple crops of the country, along with their methods of raising the crops are not widely accepted by the local communities and governments. The local governments are very weary of the new products being developed by geneticists. They have made all new products undergo rigorous testing to determine their safety for commercial use. This is a caution that is advised, but it has caused a stall in the spread of the new products and methods. The governments are refusing to accept the products until they have gone under their own tests, but the funding and resources for the tests are almost nonexistent. Without the proper funding, the products may not be properly approved by the government. There needs to be encouragement to the government of Egypt to recognize these products as safe and providing, if the government were to support the varieties it would provide a new sense of security for the farmers. My recommendations are for the government to run its own tests alongside another country to aid in managing the expenses and to spread further knowledge of the varieties. Providing cases where not all the products may be strictly genetically modified may also be beneficial. Using selective breeding has been very useful in many instances. Currently it is often accepted more than genetic engineering for the fact that our ancestors have been doing it for thousands of years and nature can even have its own part in this method. On the contrary this is a much harder method because the two plants have to be the same breed to pollinate, but it could provide small steps in the right direction and spark an interest in biotechnology for the Egyptian people.

The area surrounding the Nile and the Nile Delta has supported the people of Egypt for thousands of years. Agriculturists have been intensely farming the Nile and its surrounding area since the earliest of establishments have existed. The annual floods deposited silt that made the land surrounding the Nile of the only arable land for thousands of miles. As irrigation methods became widely used and accepted, it seemed more practical to take advantage of the new innovations, versus depending on the unpredictable floods of the Nile. Engineers then built the Aswan Dam to control the flooding. There are now only two major branches that are silting and adding some relief: the Damietta and the Rosetta. The flood control's benefits are the ability to build on the flood grounds, but the main drawback is the loss of the silting process that had distributed the nutrients in the soil necessary for the production and sustainability of the life of the plants and the populace living on the land. The development of the land for commercial purposes and the continuous farming has created a less prosperous environment and the resources are dwindling. Native species of animals and plants are beginning to become endangered and the land is no longer producing as much as it used to, but new sustainable practices may be the solution to this developing problems.

Sustainability for an agriculturist in Egypt has a different connotation than one in the United States. Although the goals of sustainable agriculture may be the same, for those involved in agriculture in Egypt it may seem nearly impossible to accomplish what farmers in other countries like the United States have, but the needs are the same. Through the thousands of years of farming and usage the small amount of fertile land that Egypt has is losing its nutrients. Spreading practices that conserve nutrients can help

restore them and encourage the growth of crops for agriculture as well as for the native species. Crop rotation can give the land a chance to regenerate the necessary nutrients for life that the agriculturists need. Rotating between crops that use a considerable amount of nutrients yearly, like corn, with a crop that helps to restore nutrients, similar to soybeans. At the least it will give the land a break from the extenuating drain of resources caused by the year's crops. Also, practices similar to using a percentage of a farmer's crop a year, while resting the other, will help to conserve. By using three quarters of a farmer's land while resting the other can conserve the nutrients of the resting lands. Although it may appear the farmer is producing less, the conservation of nutrients will prove to be more valuable than the direct production of more plants, because the resultant will be more yields per plant. This is an older method, but has been proved to help conserve nutrients. These methods would best be delivered not only by professionals, but by other agriculturists from the United States, as well as other area farmers who may have been experimenting with them in the past. The deep roots of Egypt keep a strong sense of pride for those in the community who respect the land of their ancestors. In the past it has been proved more successful to have another member of a similar operation mentor the subject on the matter than a professional who they believe is more or less lecturing not helping.

Practices that "save" the land in general are imperative to Egypt's continuation of its production. Considering that, at the present time, Egypt's arable land is diminutive compared to the entirety of the land of Egypt and also compared to the necessary land to support a growing country the size of Egypt. The prevention of the erosion of the land of Egypt is vital to its survival. If the process of making use of the searing desert land of Egypt proves too challenging, we must ensure that the current land is not wasting away to the elements. Bearing in mind that even the productive land of Egypt sees very little rainfall, water erosion does not pose a major problem, but preventing what little it does create can prove beneficial. Methods that prevent wind erosion will also keep precious land from being lost in the air. Practices like no-till can be beneficial, but considering the lack of modern equipment, it may not be as beneficial for Egyptian agriculturists as it is for a more modern agriculturist. None the less, practices that prevent the erosion of the land will help ensure crops for future and present generations. In areas where wind and sand storms are more common, like the desert, are where Egypt is going to have expand their agricultural practices. In order to do this, the combination of several solutions may be in order.

The combination of developing new crops to expand the area of production, with the spreading of new agricultural practices will create the desired outcome for Egypt. It will provide new areas and sources of production for the populace of Egypt. The practices will help ensure that they can continue to use the newly developed resources, combining these two solutions that separately can be applied to current areas to boost production, can also be combined to expand production, and will prove to be the real challenge and the real solution. If we spread the new methods that used to grow the genetically modified crops and the methods to sustain the land that it will be grown on, will create an environment that will not only produce, but thrive. With the research being done, crops that can grow with little to no water, may be a reality. With these new innovations, we can combine the methods of terracing, with native desert plants in order to prevent the erosion of the land. In the desert, where wind storms are a common occurrence, erosion is a major problem. Other practices will be necessary to keep the ground where it is. With the hardy crops that will be able to survive in this environment, not only will Egypt be able to see the prospering and satisfaction of its population, but other countries may as well.

Not only will the innovation of the minds of the world be necessary for this betterment of the modern civilization of Egypt, but it will need the support of the population as well as the resources. The resources from this product will have to be the direct product of the cooperation of the countries of the world.

Strictly speaking, the topic of Egypt has been the main subject, but in retrospect, the entire world can, and will benefit from these advancements. These practices can be used in other areas of the world that are struggling with same issues as Egypt. The citizens of Egypt and the world need to recognize these current and possible advancements as viable solutions. According to many research institutes, it has been a widely accepted fact the population will reach nine billion in the upcoming decades. Egypt and the world cannot expect to feed the hungry mouths with the same methods. It is then up to the producers and researches that are working on these innovations to produce honest, fair, and safe products. For food security for Egypt, it will take the innovation needed to create new and better crops, to not only produce more, but in order to expand the available land to produce the goods the country needs. It will also take the development and spreading of specific agricultural methods to conserve what Egypt already has. The methods may come from another source that has successfully tested methods with outstanding results or it may come from the direct creation of a method designed for Egypt's specific needs. Either way, change needs to happen. Finally, it will take the combination of the two. We need new crops to produce more while expanding the land available, but we will also need to develop and revise, new and old methods for the farmers risking it on the new land that the experiments will take place on. As well as for the farmers on current grounds, because what good does expansion do if it cannot be sustained. It appears that addressing the needs of Egypt can ensure thousands of people food security for years to come, but may also fulfill the goal of providing food sources and sustainability to the world for years to come.

## Works Cited

- "The Annual Nile River Flood." *ThinkQuest*. Oracle Foundation. Web. 03 Mar. 2012.  
<<http://library.thinkquest.org/J002046F/flood.htm>>.
- "The Building of the First Aswan Dam and the Inundation of Lower Nubia:." *The First Aswan Dam*. Web. 03 Mar. 2012.  
<<http://www.umich.edu/~kelseydb/Exhibits/AncientNubia/PhotoIntro.html>>.
- "Egypt Agriculture - Cropping Patterns, Production, and Yield." *Country Studies*. Web. 29 Feb. 2012. <<http://www.country-studies.com/egypt/agriculture---cropping-patterns,-production,-and-yield.html>>.
- Hopkins, Martha. "Egypt MODERN EGYPT - Flags, Maps, Economy, Geography, Climate, Natural Resources, Current Issues, International Agreements, Population, Social Statistics, Political System." *WorkMall.com*. 2011. Web. 03 Mar. 2012.  
<[http://workmall.com/wfb2001/egypt/egypt\\_history\\_modern\\_egypt.html](http://workmall.com/wfb2001/egypt/egypt_history_modern_egypt.html)>.
- "Modern Egypt - People, Culture and Life in Today's Egypt." *Modern Egypt*. Web. 01 Mar. 2012.  
<<http://www.all-about-egypt.com/modern-egypt.html>>.
- NICHOLSON, BLAKE. "Monsanto Tests Drought-tolerant Biotech Corn." *Msnbc.com*. Msnbc Digital Network, 13 Mar. 2012. Web. 01 Mar. 2012.  
<[http://www.msnbc.msn.com/id/46714587/ns/technology\\_and\\_science-tech\\_and\\_gadgets/t/monsanto-tests-drought-tolerant-biotech-corn/](http://www.msnbc.msn.com/id/46714587/ns/technology_and_science-tech_and_gadgets/t/monsanto-tests-drought-tolerant-biotech-corn/)>.
- Wilson, Penelope. "The Nile Delta." *A World Top 100 University*. 2007. Web. 02 Mar. 2012.  
<<http://www.dur.ac.uk/penelope.wilson/Delta/Delta.html>>.