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Egyptian Land Reclamation Efforts

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Report Highlights:
The Egyptian Ministry of Agriculture announced an effort to reclaim approximately 1.5 million acres (607,028 ha) of marginal or desert lands for agricultural use. Egypt has undertaken similar strategies in the past with limited success. The country's agricultural lands are increasingly strained due to limited water resources and significant urban encroachment.

General Information:

Egypt's (Increasingly) Limited Supply of Agricultural Land

Egypt is in a unique and, arguably, unfortunate position with regard to its land resources. While the country's total land area is 995,450 square kilometers, only 3.6 percent of that land is arable. The remaining 96.4 percent of the country's area is dominated by a vast desert plateau. The preponderance of arable land is situated along the Nile River and its delta to the North up to the Mediterranean coast. The fertile soils of the Nile Valley are among the most productive in the world in terms of agricultural yield and mild Egyptian winters create conditions conducive to year-round cultivation of many cereal and horticultural crops. In spite of its productivity, limited arable land leaves the country heavily dependent on imported food products.

Egypt's population is young, increasingly urbanized and expanding. The population currently stands at close to 90 million and is growing at 1.79 percent (2015 est), with the average woman having 2.83 children. United Nation's estimates put the Egyptian population at 150 million by 2050, with continued growth through the end of the century. Forty-three percent of this growing population lives in the country's urban centers, and almost all live in or near the Nile Valley. Demand for food and agricultural products is expanding with the population and competition for the limited land resources of the Nile Valley is fierce.

Egyptian agriculture – and subsequently Egyptian food security – faces a number of new and heightening concerns for the industry and policymakers alike. As the rural population grows, land is fragmented into smaller and smaller parcels, delaying the adoption of many modern agricultural techniques and stymieing the development of economies of scale. This fragmentation is not unique to that being experienced in other, more developed economies; however, it is more acute given the limited total area of arable land. With low returns from small land holdings, farmers are incentivized to seek out higher value uses for their land, such as real estate development or other non-agricultural uses. This scenario, of course, encourages encroachment of urban development onto agricultural lands. From 1984 to 2007, official Egyptian sources put the rate of urban encroachment at 13,000 hectares (ha) per annum. Since January 2011, that rate has increased to 21,000 ha per year.

In addition to the problems associated with fragmentation, low returns and urban encroachment, a number of external forces threaten Egyptian agriculture. Rising sea levels associated with climate change are expected to increase salinity in the northern governorates of the Nile delta. This will negatively affect a large swath of Egypt's high-value agriculture land. Similarly, changing river flows associated with the construction of upstream dams, like the Ethiopian Renaissance Dam, represent another threat to Egyptian agriculture.

Farmland Alchemy (or, the Transformation of Desert to Farmland)

Recognizing the arable land limitations inherent in Egyptian agriculture, successive governments have proposed numerous *land reclamation* proposals to convert proximate or marginal desert land into agricultural production. The first of these projects was developed in the 1930s and later iterations continue to the present day. Public sector leadership typically initiated these undertakings with varying levels of participation from farmers or other the private sector interests. In the 85 years from 1930 to 2015, FAS Cairo estimates that land reclamation efforts in Egypt yielded an additional 2.6 million

feddans (1.09 million ha) of agricultural land. This is equivalent to an increase of 44 percent over the period. (Note: 1 *feddan* = 1.038 acres)

A Modest Proposal

The Ministry of Agriculture announced an important land reclamation goal in 2009. In a strategy paper, the ministry laid out a plan to reclaim an additional 3 million *feddans* (1.26 million ha) by 2030. Due to the political and economic turmoil in the years that followed, that plan never came to fruition. However, in 2014, President Abdel Fatah Al Sisi announced that the program would move forward beginning with a 1.5 million *feddan* (630,000 ha) reclamation project, which would include integrated agricultural communities and agricultural industrial zones.

As a first step to the development of this 1.5 million *feddans*, the government began reclaiming a test area of 10,000 *feddans* (4, 200 ha) near the oasis community of Farafra in the Western Desert. They completed the drilling of irrigation wells and reportedly planted crops on 7,500 *feddans* (3,150 ha) within the developed area.

The next step in the new reclamation program is the drilling of over 5,000 irrigation wells. The first 600 are already underway in several areas of the Western Desert including: Wadi Moghra, the Toshka region, and the Farafra Oasis. The Ministry of Agriculture's draft report on the project notes that water for 80 percent of the reclaimed land will be sourced from underground aquifers, with the remaining 20 percent coming from the Nile River. The total cost of the wells is estimated at LE 16.7 billion (USD 2.13 billion). A number of wells will operate using solar energy, presumably decreasing operating costs.

Once the land reclamation project is complete, Egyptian authorities plan to distribute the reclaimed farmland amongst a number of potential groups. The first of these are young university graduates, who can be granted shares, equivalent to 3-5 *feddans*, in an agricultural cooperative organization that will manage production on the land. The second are Egyptian firms that can access the land through long-term leases or purchase agreements. The third are foreign investment firms who will be able to request long-term leases on the land while receiving tax incentives on rents extracted from those lands for a period of ten years.

And now, for the rest of the story…

While the Government of Egypt's objectives in land reclamation are laudable, and certainly necessary in the long-term, post has identified a number of significant challenges that could ultimately hinder the project's success. The first of these are the costs. Estimated costs for completion of the project reach as high as LE 37 billion (USD 4.7 billion), which is significant given the country's precarious economic situation. The second challenge is water. Drilling and maintaining 5,000 irrigation wells in harsh desert conditions will require significant technical expertise as well as a long-term resource commitment. Additionally, sustainability of the water source is brought into question when using underground water. The third challenge is management of the reclaimed land. It is not entirely clear yet how land will be distributed and which parties will be responsible for maintenance of the infrastructure. If land reclamation is successful, its future usefulness will depend on clear rules and responsibilities among all parties involved.

Post remains skeptical of the government's ability to overcome these challenges in full. In the past, the Government of Egypt began similar projects only to be delayed by these or comparable difficulties. The

most successful Egyptian land reclamation projects in recent history have involved private sector participation; however, it is not completely clear to what extent the private sector will be involved in the current project. Even if the administration's land reclamation goals are reached, it is uncertain if the economic realities will incentivize firms to produce on reclaimed lands. As the project advances, a more thorough economic analysis is warranted.

The Egyptian Government has not clarified the exact crops that they expect to be produced on reclaimed lands. Official statements suggest that *strategic crops*, likely wheat and corn, are the target. If the entire 1.5 million *feddans* (630,000 ha) were planted in wheat, and yields remain unchanged, domestic production would increase by 3.78 MMT to approximately 12.14 MMT, a 45 percent increase. A production increase of that size would reduce, but not end, dependence on wheat imports, which are currently estimated at 11.5 MMT. Similarly, if the area were dedicated to corn, a production increase of 5.04 MMT, or 84 percent, could be expected. That increase would displace much of the estimated 8 MMT of corn currently imported. In either case, a fully-implemented land reclamation project would not end Egyptian dependency on imported grains. Moreover, given Egypt's experience with reclaimed dryland, more profitable returns are likely to be achieved by using expanded area for vegetable and fruit production as opposed to row crop/grain output.