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AGRICULTURE CONSULTING

Introduction:

Our company was established in 2009, we offer specialized consulting services for the agriculture sector. We have extensive knowledge of the local market and its dynamics. Late 2011 we recognized the opportunity of using hydroponic fodder and its potential value in Yemen. We built a farm around the concept and custom built a production unit and for about a year we have been operating it. We have developed in depth expertise and we feel comfortable offering our services.

Hydroponic Fodder productions systems are being used across the globe for its advantages over traditional methods of producing fodder. Hydroponic systems produce fodder with less water (up to 90% less)¹, regardless of weather and time of year due to controlled environment, and all within a short production cycle of 7 days. The use of pesticides is also reduced to minimum and the fodder produced is highly palatable and nutritious.

We are pioneers in producing the systems in Yemen, and we have recently learnt that the Ministry of Agriculture and Irrigation has imported two productions units as a pilot program from Saudi Arabia. We think the recognition of such innovative solution is critical to resolve local challenges, however, we believe that importing such units while they could be produced locally and for a fraction of the price is counterproductive. We further discuss the advantages of our approach to that of importing in a specific section below.

The Opportunity:

Yemen has a limited amount of forest land (1% of total land area), and the population's demand for [...] fodder for livestock exceeds the regeneration capacities of Yemen's remaining forests.² Projects implemented by INGOs and local organizations to improve cattle-raising are stunted and stop short from delivering their objectives because of the lack of fodder. For example the Social Fund for Development, 2011, set to create small farmer groups to raise cattle in Almaqatera area, Taiz Governorate. The project consists of 25 groups each group of 100 sheep. The project is facing challenges due to lack of fodder. Similarly, Oxfam started its project to support small farmers to raise cattle in Hais, Hodeida Governorate. The project plan is to distribute 3500 goats and sheep for targeted villages. However, these very villages suffer from sharp lack of fodder.

¹ http://transition.usaid.gov/our_work/agriculture/spotlight_stories/f2f_el_salvador.htm

² http://usaidlandtenure.net/sites/default/files/country-profiles/full-reports/USAID_Land_Tenure_Yemen_Profile.pdf



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We believe the hydroponic fodder production units could support cattle raiser in such areas. We could also see it being beneficial in Belad Alroos and Saafan in Sana'a, Abyan, Almagatar and Mouza in Taiz, Hais, Alzahara in Hodaida, as well as other area depending on rainfed agriculture.

Also the fodder production units could be of great value to refugees living in refugee camps due to the local wars as in Sadaa Governorate.

Inputs:

The expertise, materials, and components needed to fully build the hydroponic fodder production units locally are available within the local market. Our engineers have developed an in-depth expertise of all aspects of building, operating, and maintaining a production unit. During our 1 year trial period we documented all aspects of the production process, as well as the specific local challenges and the solution we designed. We believe that the qualifications and expertise we have developed are key to building a local product that address local needs and overcome local challenges.

Almost all material and components that go into building the unit is either purchased or custom-built for us from local providers. This includes the solar system, the isolators, the cooling system, the mist irrigation system, and the rest of the material that goes into building the units. This ease of access to materials reduces the maintenance costs and enables local providers to offer extended services.

Locally sourced grains to be used in the production of fodder are also sourced locally, and we have developed ways to ensure proper treatment to minimize/eliminate risk of mould as well as maximize fodder quality.

Water to be used with the misting system will need to be sourced from nearby wells. A production unit with capacity of 500kg/day will require about 200 Liters of water per day.

Cost:

The cost of one hydroponic fodder production unit will ultimately depend on the final specification, especially in terms of production capacity and need of mobility. For the purpose of this proposal we will discuss the cost of a fodder production unit with production capacity of 360 Kg/day. The cost of such unit will be around \$18,000. This cost includes the cost of training 2 workers on operations and routine maintenance of the unit.



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If these units were to be implemented on a larger scale in terms of numbers and capacity, we believe further cost cuts could be introduced.

The operation costs of the production units are minimized because they are not labor intensive, and require minimum fuel quantities as they are mainly powered by solar panels.

Output & Impact:

Due to the controlled environment of the production units, fodder production is consistent and stable all year round. The reliable nature of the output will provide cattle raisers the ability to create longer term plans and be able to better manage their production. Furthermore, the higher quality of the fodder will result in healthier and stronger livestock. The fodder produced is highly nutritious and rich with protein, vitamins, minerals, and growth factors.

The amount of fodder produced compared to the water needed will help preserve water and ensure best usage of a limited resource. It is also an organic process and the use of pesticides and herbicides is not needed.

People living in areas that have poor or no grazing, or those that depend on rainfall, will benefit substantially from the fodder production units as an economic solution that will give them more control over their environment.

Benefits and comparison to Imported Systems:

Our main engineer was able to examine the hydroponic production units purchased by the Ministry of Agriculture and the following are the main contrasting points:

- Cost: The cost of a locally made fodder production unit at the same level of quality of the imported unit is about \$18,000 compared to \$35,000 for the imported unit, both with the same production capacity of 360kg
- Power requirements: The locally produced unit uses environment-friendly power source (solar power) and designed to require minimum power levels (done by consideration to the cooling system, the light source, etc), which make it best suitable for rural Yemeni environment, while the imported unit requires an electricity power source independent of the unit.



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- Customization of Production Capacity: Given that our units are locally made, we are capable of designing the units per the production capacity required. For example, small fodder production units of less than 100kg could be designed to support small farms.
- The Chassis of the Unit: The chassis of the imported units are metallic, while the locally produced units could be customized to best fit the available space by either building, or using existing space in a farm or a house, and also by using the locally available material in the area.
- Being a local partner we are readily available to provide training, maintenance, or spare parts when needed.
- Producing the units locally has a positive impact on the whole value chain of production. It also offers a positive example of innovative technology being adapted to fit local needs.
- The locally made units, although using the same hydroponic fodder technology, are created with simpler techniques and equipment, which make it simpler for farmers, males and females alike, to adapt to and use.
- The locally made units could be linked to rain-water harvesting systems as they consume minimum quantities, approximately 50L for producing 100kg.

The hydroponic fodder production systems could have a positive impact on Yemeni farmers and livestock raising in Yemen. We believe we are the right partner to work on such efforts due to our experience and expertise. A comprehensive approach could be developed about where and how the production units should be introduced and what customizations are needed to insure efficiency and effectiveness of solution as well as adoption by target group. We are looking forward for a meaningful cooperation to create sustainable solutions that help Yemeni farmers and Yemen's economy.