**Tiruzer Ethiopia for Africa (TEA)**

**A Pilot Project on Spirulina Production and Distribution in Ethiopia**

**Project Document**

1. **Introduction**

The purpose of this project is to pilot the production and humanitarian distribution of micro-algae Spirulina to fight malnutrition in Ethiopia. Spirulina is a simple, one-celled form of blue-green algae that thrives in warm, alkaline fresh water bodies. Spirulina contains 65-71% complete protein, with all essential amino acids in perfect balance. Spirulina has multi-dimensional socio economic benefits. Spirulina has been documented by UN, WHO, UNESCO, USDA, DSIR and many reputed International organizations as the most ideal and one the best food for tomorrow.

This pilot project is implemented in Addis Ababa City and once the results have been achieved, will be the gateway for the establishment of Spirulina production and distribution center in Gambella City for mass production by the Intergovernmental Institution for the use of Micro-algae Spirulina Against Malnutrition (IIMSAM) whose mandate is to promote the use of Spirulina to combat malnutrition worldwide and HashBioTech Labs (Indian based laboratory specialized in micro-algae).

1. **Project Significance**

In Ethiopia, despite the ongoing and rapid growth of the national economy, the problems of malnutrition, especially among women and children groups in areas of food insecurity continue to pose a monumental challenge to national and regional development efforts. Malnutrition affects 1 in every 3 people in the country and is responsible for almost half of all under five mortality rates. According to Cost of Hunger in Africa Ethiopia Report (COHA) authored by AU et al, 2016, total losses associated with under-nutrition are estimated at ETB 55.5 billion or US$4.7 billion for the year 2009. These losses are equivalent to 16.5% of GDP of that year.

Due to recurrent drought, environmental degradation coupled with the current climate change, the country remains food insecure with severe mal-nutrition problems. Thus, to address these and related constraints, there is an urgent need to develop alternative natural and climate change resilient agricultural system to enhance climate change adaptation and mitigation capacity of the communities. Micro-algae Spirulina is the perfect solution to this menace not only because of its high content of nutrients but its production is easy as justified by the following reasons;

1. Can be produced locally and so has social as well as economic benefits
2. Does not need fertile land for cultivation and therefore conserves fertile land and soil
3. Uses simple technology and locally available materials
4. Requires much less water to grow than vegetables as the water is recycled back to the ponds after harvesting
5. Stimulates the education of local women about nutrition
6. Can be combined with other products (e.g. rice, etc.) to be made into locally acceptable food products all around the world
7. Very effective, contains most essential micronutrients in high concentrations so 1 gram per day can combat malnutrition within a month.
8. It is a big oxygen producer that is even more efficient than trees and forests to absorb Carbon dioxide
9. Very safe, it is resistant to most contamination due to highly alkaline environment
10. **Implementation Approach**

This pilot project is implemented by Tiruzer Ethiopia for Africa (TEA) in Addis Ababa in partnership with Gambella University (Ethiopian Public University) and Just Spirulina (Israel based NGO with vast experience in Spirulina growing and training of farmers in Israel, South Africa, Rwanda and DRC). The production site (farm) is provided by TEA and Just Spirulina provided a pure culture of Spirulina to cultivate from and sent a team of technical experts to come and train the team from TEA on production, harvesting, packaging and consumption of the end products. TEA will then train groups of local residents preferably women and youth on the same.

The pilot project requires only one greenhouse shade housing the ponds which TEA constructed with financial support of Gambella University and close supervision of the team from Israel for technical specifications and a drying site. The drying machine is yet to be purchased.

Once the pond was constructed, using the culture from Just Spirulina, cultivation commenced and daily care and monitoring is handled by TEA all through to packaging as guided by the experts from Israel. This is anticipated to take a period of three months to get the first products which will be tested and approved by the Ethiopian Food, Medicine, and Health Care Administration Authority and distributed to the malnourished populations. The final products will be in form of powder, tablets, capsules and candies which are easy to use as food supplements and immune booster due to its high protein and nutrients content. To obtain these final products with full nutritional contents, the harvested product which is harvested every 3 days is dried and grounded.

1. **Project Status**

The pilot project commenced on March 2019 and so far we have achieved the following;

1. The greenhouse shading the Spirulina cultivation pools is completely constructed and fully operational.
2. There are 4 spirulina cultivation pools inside the green house measuring 2m by 2m which now contain growing Spirulina.
3. The Government of Ethiopia through the Ministry of Environment, Forest & Climate Change and Ethiopian Food, Medicine and Healthcare Administration and Control Authority assigned their personnel to monitor the pilot project.
4. All the fertilizers and devices required to grow and monitor Spirulina have been acquired, some had to be outsourced from India.
5. A pure strand of Spirulina culture was sourced from Tel Aviv, Israel through our partner, Just-Spirulina, and arrived to the growing site in good condition. The culture was multiplied progressively to fill the 4 pools.
6. A team of 8 people from Just Spirulina which is a Tel Aviv based NGO with vast experience in growing Spirulina and training new farmers in Israel, DRC, South Africa and Rwanda came to provide technical training to our team in Addis Ababa.
7. The Spirulina are now growing in 4 different pools and are being monitored twice in a day and they are doing great.
8. We started harvesting mature Spirulina in small quantities and dried them ready to be distributed once the quantity has increased.
9. A local Television, LTV, recorded our program which was aired three times a day for two consecutive days last month.
10. We also did a press conference on Thursday, 4th April 2019 with 23 journalists representing 5 Televisions, 3 Radios and 4 Magazines and other 7 different popular social Media tubes in Ethiopia. Our representative in United States, Mr. Khalid Hassan, participated in the press conference via Skype. The Chief Executive Officer of Just Spirulina in Israel, Ms Maya Savir, participated through Skype as well. The program was aired for five days in the media.
11. **Target Groups**

As a pilot project, the direct beneficiaries are the staffs of TEA and groups of local residents (women and youth) through technical training and production capacity building from the Israeli expert team. To closely monitor the effects of Spirulina on the consumers, the project will be integrated with an existing school feeding programme within Addis Ababa City and 1000 school children are set to benefit.

The final products will be used by other populations which are more prone to under-nutrition and deserve special attention in Addis Ababa City. These populations includes pregnant and lactating women, adolescent girls, school children, infants and children under the age of 5 years and people living with HIV/AIDS.

1. **Expected Outcomes**
2. The project will employ young people locally and develop new local skills
3. Improved health outcomes of targeted groups
4. Reduce child and maternal mortality rates associated with under-nutrition
5. Beneficiaries especially women will be empowered in establishing long term and sustainable livelihoods and be able to take care of their basic needs and those of their families
6. The project will also reduce unemployment of vulnerable young people and improve their social and economic livelihoods
7. The products will improve the health outcomes of People living with HIV/AIDS and reduce the costs and burden associated with them
8. The project will help fight food hunger among poor communities and reduce malnutrition among children and support profound health benefits
9. Mitigation of climate change through elimination of waste (CO2)



***A model of the production site***

1. **Budget**

The following is the budget required for the project to be implemented.

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| --- | --- | --- | --- | --- |
| **Item** | **Unit of Measure** | **Number of Units** | **Unit Cost** | **Total Cost (USD)** |
| Round Air tickets from Tel Aviv | Tickets | 8 | 550 | 4,400 |
| Accommodation and per diem for Israeli technical team | Days | 8 | 485 | 3,880 |
| Full time worker | Months  | 6 | 535 | 3,210  |
| Greenhouse construction | Number  | 1 | 30,360 | 30,360 |
| Pond construction | Number | 4 | 180 | 720 |
| Water | Litres | 3,600 | 0.25 | 900 |
| Fertilizers &Chemicals  | Kg | 150 | 107 | 16,050 |
| Litmus paper | Packets  | 15 | 10 | 150 |
| Filtration Nets | Number | 4 | 100 | 400 |
| Microscope rent | Number | 1 | 535 | 535 |
| Gloves | Packets | 10 | 10 | 100 |
| Electricity | Months | 6 | 55 | 330 |
| High speed centrifugal Spirulina drying machine | Number | 1 | 10,000 | 10,000 |
| **TOTAL PROJECT COST** **TEA’s Contribution****Requested from Global Giving Crowd funding** |  |  |  | **71,035 USD** **61,035 USD****10,000 USD** |
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