SPIRULINA PRODUCTION TO FIGHT MALNUTRITION AND PROMOTE LOCAL ECONOMIC DEVELOPMENT

The Antenna Foundation, founded in Geneva (Switzerland) in 1989, is among the international landmarks in research and dissemination of technologies to promote the production and use of Spirulina against malnutrition at the local level.

Spirulina (Arthrospira platensis) is a microorganism that develops rapidly by photosynthesis either naturally in the alkaline waters of certain lakes in hot zones or in basins. Thanks to its composition, Spirulina is of great nutritional value, that is: rich in vitamins, iron, calcium, magnesium and essential amino acids, it also has very high protein content.

Spirulina was a food source for the Aztecs and other Mesoamericans until the 16th century. Spirulina has also been traditionally harvested from small lakes and ponds around Lake Chad (Chad), where is used to make meals, and also sold in markets. Today the extraordinary nutritional property of this algae is well known worldwide and large enterprises produce Spirulina products as a dietary supplement with industrial processes and distribute them in the international market.

However, the production of Spirulina in lower industrialized countries is still lacking, despite the important contributions it could make to the health and economic development of local communities. The World Health Organization (WHO) considers spirulina *as an interesting food for multiple reasons, rich in iron and protein.* In 2003 the United Nations established the Intergovernmental Institution for the use of Micro-algae Spirulina Against Malnutrition. The production and use of Spirulina is also recommended by FAO *as food for humans and feeds for domestic animals and fish,* giving communities access to a local and sustainable source.

In this context, the Antenna Foundation has developed tools and training processes in order to spread at the international level the technical knowledge to implement small farms producing Spirulina at low cost, in order to meet the needs of the population as a whole. In particular in the Antenna website two practical guides of Spirulina cultivation are available:

- Grow your own spirulina (in french), Jean-Paul Jourdan and Antenna Technologies, (2013 update)
- Small news of artisanal and solidarity spirulina cultivation, Spiruline France, Jean-Paul Jourdan

Today the farms implemented with the support of Antenna Foundation and producing Spirulina in an affordable way are running in Burkina Faso, Cambodia, Laos, Madagascar, Mali, Mauritania, Niger, Central African Republic and India.

These Spirulina farms actually create revenue streams for the local community, producing a dietary supplement which is grown, sold and consumed locally. There are varying scales of production, from household level of micro-production to semi-industrial plants. At the level of micro-enterprise plants (producing between 50 and 3,000 grams of dried Spirulina a day), all materials and most necessary equipment are normally available locally and the start-up requires a low investment.

The Antenna website underlines the most important advantages of Spirulina production and use at local level:

- It's effective: a daily dose of 1 to 3 grams of Spirulina, for 4 to 6 weeks, will cure a malnourished child.
- With its high productivity and the small amounts of Spirulina required per person, the growing surfaces required are also very small (5 to 6 grams of dry Spirulina a day, per m²; 15 times less than sugar cane, 20 times less than soya and 250 times less than rice).
- The volume of water required is much less than for any other form of agricultural production (3 to 4 times less than soya and 5 times less than maize).
- Given that spirulina is a photosynthetic micro-organism which grows in an aquatic environment, it avoids any problems of soil quality, parasites or plant disease.
- Harvesting can be on a daily basis, and starts very soon after sowing the tanks. Generally, the first harvest is within a month and half of starting operations. Harvesting is made through a simple filtration of the growth medium. The filtered mass is then dried and processed during the rest of the day.
- Fresh Spirulina can be eaten directly without any processing or cooking, and additional use of energy.
- With adequate packing, Spirulina and Spirulina-enriched products can be stored for long periods and sold on local markets. The small farms can establish a network for distribution as well as a communication strategy on the nutritional qualities of Spirulina.

Antenna Foundation estimates pond installation costs between $15 and $30 per square meter. Funds invested in local spirulina production are spent in the territorial health and economy. A pond of 200 square meters will produce enough spirulina for 1,200 children per year, creating a sustainable food supply chain, local employment and income.

In order to make the production process more affordable, Antenna Foundation has also developed circular ponds to decrease costs by 20%. Production technology is simple and the project was awarded First Place Prize in the International Algae Competition.

To know more

Antenna Foundation website

Antenna India Nutritech

Antenna France

Antenna France in Facebook

Article in Amadea website

IIMSAM website

Spirulinasource website

News.algaeworld.org

Spirulina in Wikipedia

Article in Tatup-journal.de

Algae Industry Magazine

Antenna Foundation Annual reports

Grow your own spirulina Manual

Small news of artisanal and solidarity spirulina cultivation

ftp://ftp.fao.org/docrep/fao/011/i0424e/i0424e00.pdf.