



SGP The GEF
Small Grants
Programme



Biodiversity Conservation



Climate Change

ENVIRONMENTALLY SUSTAINABLE CONSERVATION & MANAGEMENT INITIATIVES



सर्वोदय सर्वे
Ministry of Environment &
Forests (MoEF), India



GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET



CEE

Centre for Environment Education



Preparation of Bokashi Compost

Project Background

In 1982 Dr. Higa at the University of Ryukyus, Okinawa Japan, discovered a specific group of naturally occurring beneficial microorganisms with an amazing ability to revive, restore, and preserve. He named this group E.M. (Effective microorganisms).

IMO is the abbreviation for **Indigenous Micro-Organisms**. IMO is a combination of useful regenerated micro-organisms that exist freely in nature and are not manipulated in any way.

This mixture increases the natural resistance of soil, plants, water, humans, and animals. IMO considerably improves the quality and fertility of soil as well as the growth and quality of crops. Bethany Society (BS) approached the GEF UNDP /SGP hosted by CEE. Several discussions resulted into developing an approach for promoting the conservation and scaling up practices in the use of this model Bokashi Piggery technology.

IMO consists of the following five families of micro-organisms:

1. Lactic acid bacteria: these bacteria are differentiated by their powerful sterilising properties. They suppress harmful micro-organisms and encourage quick breakdown of organic substances. In addition, they can suppress the reproduction of Fusarium, a harmful fungus.

2. Yeasts: these manufacture anti-microbial

and useful substances for plant growth. Their metabolites are food for other bacteria such as the lactic acid and actinomycete groups.

3. Actinomycetes: these suppress harmful fungi and bacteria and can live together with photosynthetic bacteria.
4. Photosynthetic bacteria: these bacteria play the leading role in the activity of EM. They synthesize useful substances from secretions of roots, organic matter and/or harmful gases (e.g. hydrogen sulphide) by using sunlight and the heat of soil as sources of energy. They contribute to a better use of sunlight or, in other words, better photosynthesis. The metabolites developed by these micro-organisms are directly absorbed into plants. In addition, these bacteria increase the number of other bacteria and act as nitrogen binders.
5. Fungi that brings about fermentation breaks down the organic substances quickly. This suppresses smell and prevents damage that could be caused by harmful insects.

What is Bokashi Technology?

Bokashi Piggery is a Japanese and Korean pig conservation and rearing system propagated by practitioners of natural farming which uses "Micro-organisms" techniques. It has been introduced for the first time in India and in Meghalaya. Bokashi is a Japanese word meaning "Fermentation". This technique keeps the pig pens odourless, ensuring hygienic practices, better health and faster growth of pigs. This has had a positive impact on the traditional pig rearing system of rural poor farmers of Khasi Hills. Bokashi compost is prepared from chicken manure, top soil/forest soil, wood ash, charcoal, water, Indigenous Micro-Organism (IMO), bamboo vinegar, and egg shells. Rice bran is recommended as an important ingredient of this compost. IMO also plays a major role in conserving and propagating this technique, as its application on the floor of the pig shade deodorises it. Moreover, it also provides organic compost as a by-product which is being used by the rural farmers to cultivate vegetables.

Indigenous Micro-Organism



Collection of Indigenous Micro-Organism from the Forest

Project Objectives

- Train selected village communities in the collection and culturing of IMO from community forests and to use it for sustainable organic farming and piggery management.
- Preserve the environment by causing reduction in CO2 emission and check pollution of local streams and rivers by recycling of waste.
- Revive the degraded farm lands with the use of Bokashi compost and organic farming.

Strategic Approach

The NGO Bethany Society adopted the **participatory approach**, using the village maps as means to building rapport and trust, which also led to create awareness and agreements in villages how to do the program

Later the NGO adopted the **formation of local kinship based, local institutions:** 42 mixed self help groups (SHGs) were formed and their members given training on piggery management, poultry, organic farming, book-keeping and documentation. 38 SHGs were graded by the bank and were linked for loans and subsidies and nearly Rs 550,000 as loans to a saving of Rs 150,000 made by the SHGs.



NABARD Farmer's Club programme was setup to implement the activities on the ground, such as strengthening farming techniques and awareness on markets and credit linkages with regard to the production of vegetables and livestock.

Local **Village Volunteers** were then created to be made aware of running the program and were imparted skills based trainings. Focussed trainings provided to the farmers:

- **Training in the collection and multiplication of IMO and Organic Compost**, and their use in livestock management and production of various inputs for agriculture. It was conducted in all the 14 villages and 15 farmers among them volunteered to use a part of their field for experimentation of growing rice, potato and vegetables.
- **Training in piggery conservation and management**, operationalizing Bokashi model Piggery, a unique method which reduces drudgery, smell and produces healthier pigs. This training was conducted for all the 14 villages (14 programs) and over 500 villagers availed of the training.
- **Training in organic farming** with regard to potato and vegetables was conducted for all the villages and more than 510 villagers were trained. The use of micro-organisms from the forest, which is a part of the bio-diversity, was done for income generation purposes and for Bokashi Piggery and natural farming.
- **Linkages established with -**
 - 1) Meghalaya Cooperation Apex Bank and Meghalaya Rural Bank to access timely and cheap credit;
 - 2) Government/DRDA/(District Rural Development Agency) programs for in-kind financial assistance;
 - 3) Many of the Government agencies such as the Forest Department, Rural Development, the Autonomous District Council, Botanical Survey of India, ICAR, NABARD and Banks both for technical and financial assistance, that leveraged cash and in-kind financial support for the programme activities.





Smokeless Cook-stove

Project Results

- 7 units of Bokashi Piggery Units have been provided by GEF/UNDP SGP, and the ripple effect led to scaling up another **21 units** financed by the bank through loans to SHGs. Loans have been released to 14 units.
- 350 farmers have benefitted from the training programs on piggery, poultry, organic farming and also by technology transfer, credit counselling and market advocacy.
- 40% reduction in the input costs and an average increment of 20-50% in the harvest has resulted by the training provided in collecting and multiplication of IMO and preparation of organic inputs.
- Saved usage of 1500 kg of fire-wood per house-hold per annum as a result of new method of feed-stock for the pigs, leading to CO2 emission reduction. The above 28 units resulted into a saving of 42,000 kgs of wood per annum.
- With the co-financing received, Bethany Society also introduced efficient cook-stove models that reduce the fire-wood saving by 60%. A total of 15 household were provided with 15 cook stoves, resulting to firewood saving of 3240 kgs of woods per household per annum (A total of 48,000 kgs of wood equivalent to 87 Mts of CO2 checked per annum).
- Manuals for Bokashi Piggery, Collection and multiplication of Lactic Acid Bacteria, organic composts and liquid manure and pesticide have been prepared and will be published both in local and English language.
- Wild Honey was another aspect of enterprises which was an offshoot of the project as an alternative livelihoods option. Linkage was created with Mizoram and 10 farmers adopted to bee rearing and they sold 200 kg of honey @ Rs 350/- per kg. Mny farmers are now also gearing up to take bee keeping. Links are being made by the NGO to Khadi Village Industries Board (KVIB).
- IGSSS the German donor is interested in the programme and there is likelihood that they will support a two year initiative for further developing the capacity of 20 more villages and for formation and strengthening the mixed SHGs. The NGO has developed the project based on the learning's from the GEF/SGP.
- A total of 405 people including persons with disability are part of the SHGs and a total saving of INR 4, 50,000 (US \$7,500) has been mobilised through artisan work.

- Total value worth \$10,000 of renewable energy and technology services provided to the locals in partnership with DRDA.
- 50 Hectares of degraded land and 102 Hac of land applying sustainable forest, agricultural and waste management practices has been restored.
- Mr. Ricky Nelson Renthlei was awarded an Community Excellence Award at Kangwon University, Kangwando, South Korea by the United Nations Environment Programme-Eco Peace Leadership Center Korea, for doing research on the programme in uplifting the people economically and socially in 2012.

Lessons Learned

- Reaching of technologies is slow to the communities in remote areas. Therefore pressure on forests is increasing as villagers are very slow to take risks, as they are unorganised and prefer to take forward tested methods and practices.
- Inaccessibility of the local institution building is keeping them away from the banks at the village level and therefore communities are very low in confidence and the banks also take long time to process applications for loans.
- Community contributions are a must in project actions. Communities sharing costs, decisions, roles and responsibilities are leading them to build confidence in processes and practices. Poor uneducated take longer time and facilitators need to be patient in approaching them.
- New technologies which reduce drudgery need to be introduced and then scaled up.
- Rain plays a vital part in Meghalaya and during the season indoor programmes should be systematically planned so that the work progresses as per schedule.
- Youth are enthusiastic about their environment, their major focus is to move out of the rural areas and explore/seek better employment; and the project strategies, if not linked with livelihoods the project actions will sustain less.



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