

Project Report on “Establishment of Demonstration Plots for Organic Farming in Tripura” Phase II

Executive Summary: The second phase of the project “Establishment of Demonstration Plots on Organic Farming in Tripura” has been undertaken by DBT in a total of 5 hec. of land at Singerbil GP under Mohanpur Block, Chhataria GP and Gamaria GP under Matabari Block involving 20 numbers of farmers during the year 2012-13. This phase of the project has also been sponsored by the National Horticulture Board, Govt. of India. One important feature of this project is that tribal farmers have been included during this phase for organic farming activities. Moreover, DBT tried to facilitate the farmers for proper marketing of their organic products by motivating and developing linkage with the wholesale dealers of the major vegetable markets of Agartala City through a series of talks and discussions. During the first & second session of this phase, Cucumber, chilli, brinjal, tomato, bitter gourd, Beans etc. vegetables are being grown in the demo plots. The farmers obtained excellent return from their harvested crops and a sense of confidence has been built up during the implementation of the project. The beneficiaries become the spokes men for the organic cultivation. Out of total sanctioned fund of 7.10 lakhs, an expenditure of 5.87 lakhs was incurred for implementation of the phase-II of the project (Field photographs of the project activities has been submitted separately).

Initiative taken by Directorate of Biotechnology in the State: Appreciating the need and importance of introducing organic farming in the state, the Directorate of biotechnology Govt. of Tripura initially organized numbers of training and awareness workshops on organic farming in different parts of the state. The training/awareness generation program were organized targeting three types viz., the farmers, the field functionaries of the line departments of the state government and finally the members of PRI bodies at grass-root level. The objective of that program was to sensitize and reorient the mindset of the people towards organic farming. In general, the mindset for organic farming is "cultivation of crop with cow-dung, vermin-compost, neem extract and comparatively low yield is obtained". But the intervention of biotechnological approach opened a new horizon for exploring the opportunities in this sector. Subsequently the Directorate of Biotechnology took up demonstration plots in the scale at different location of the state by motivating and encouraging the farmers and providing necessary technical guidance. This endeavour of the Directorate could successfully sensitize the farming community and the farmers got interested to adopt organic farming in their plots. To demonstrate the potential of organic farming in a more effective way, this Directorate submitted a project

proposal on "Establishment of Demonstration Plots for Organic Farming in Tripura" to National Horticulture Board (NHB) Government of India. NHB approved and sanctioned the first phase of the project proposal for taking up demonstration plots on Organic Farming of Vegetable Crops in Tripura during 2011 -12. for 3 hec area. And after successful completion of phase – I, NHB has approved the same project for another two season in Phase – II with 5 hec of area in the second phase including the continuation of previous 3 hec taken in the phase – I. The new 2 hec area has been allocated for ST farmers of Gamaria village under Matabari Block of Gomti District of Tripura. The location, Nos. of beneficiaries and category of the beneficiaries are as follows. The farmers were provided with all bio inputs viz cowdung, vermicompost, Biofertilizer, bio pesticide, biofungicides, etc. along with capacity building and the cost of mandays as approved in the project proposal.

Sl No	Location	Area (Ha)	No of beneficiaries	Category
1	Singerbil GP	1.5	6	SC
2	Chhataria GP	1.5	6	SC
3	Gamaria GP	2.0	8	ST

Selection of beneficiaries: The new beneficiaries of ST category were selected through PRI system . Accordingly 8 farmers were selected from Gamaria GP under Matabari Block of Gomati District of Tripura. The beneficiaries of Singerbil and chhataria GP remain same as a part of continuation of phase - I.

Selection of Bio inputs: It is a fact that the use of chemicals for pest and disease become a regular and continuous practice. The project envisaged to change the hackneyed perception of farmers. The major obstacle of organic farming is to recommend an alternative remedy for pest disease menace in the cultivation practice. The project has given priority to select the environment friendly bio inputs to control the pest & disease of selected crops. The performance of phase – I has been incorporated and the bio inputs were selected as follows.

- 1) **Neem based pesticides:** It acts as Antifeedant, Repellent. It effectively controls the economically important pests like white fly, aphids mealy bugs etc.

- 2) **Garlic based pesticide** : It effectively controls sucking and chewing type pest of vegetable.
- 3) **Beauveria bassiana** : This is a entomopathogenic fungus. It effectively controls borers,,cut worms, root grubs,white fly, aphids, thrips, mealy bug, leaf hoppers.
- 4) **Verticillium lecanii**: This **is** a entomopathogenic fungus. It effectively controls whitefly, aphids, thrips, mealy bug, leaf hoppers.
- 5) **Paecilomyces fumosoroseus**: This is a entomopathogenic fungus. It effectively controls red spider mites, brown mites, pink mites, purple mites
- 6) **Trichoderma viride** : This **is** basically an antagonistic fungus. It effectively controls the disease causing pathogens viz Ring spot, damping off, Foot rot. Root rot etc
- 7) **Pseudomonas fluorescens** : This biological fungicide is very useful for seed and seedling treatment . It also controls the ring spot, damping off, foot rot etc.
- 8) **Use of Biodynamic**: The simple but effective use of biodynamic mechanism has been introduced to reduce the pest and disease control and also to enhance germination and crop health.

Crop Management:

- i) **Buffer Zone**: Utmost priority has been given to maintain the buffer zone . The success of the organic farming highly lies with maintenance of buffer zone In order to cultivate crops. Accordingly a buffer zone of 25 to 50 feet was left all around from the conventional farm. The produce from this buffer zone has not been treated as organic.
- ii) **Nursery Management**: the crops like chilly, brinjal were sown in nursery. The seeds were treated with Pseudomonas fluorescens , Trichoderma viride and Biodynamic preparation like bijamrut etc
- iii) **Land preparation & Sowing**: The land were prepared with the application of cowdung , Vermicompost and Biofertilizer supplied from the project with recommended dose before sowing of seeds/transplanting of seedling . The crops like Ladies finger, cucumber, bitter gourd, beans were sown directly.
- iv) **After care** : the crops were watered in a regular interval, weeding, mulching making bamboo structure for gourd group of crops and application of bio inputs were done as and when recommended.

Monitoring and Supervision :

The experts and officers of the Directorate of Biotechnology maintained continuous vigil on the plots right from the land selection to harvesting in two seasons continuously. They made frequent visits to the farmer's plots to provide technical

guidance in every step of crop management. The farmers also kept close contact with the officers of the Directorate and freely sought for advices as and when required.

Conducting Training: Two training programmes were conducted among the farmers (40 farmers for each training) involving the selected beneficiaries and neighboring farmers of the project area in a view to transfer the technology of organic farming . The participants of the training programmes were found to be motivated through the demonstration undertaken in their own village and the beneficiaries of the project share their experiences of organic farming which make a special impact to the other participating farmers of the village.

Positive changes in soil health :

The soil of the demo plots were analyzed in two phases. Initially before the commencement of cultivation practice and finally after the harvest. The plots of Singerbil GP and sataria GP shown consistent result indicating improvement of status as these two location is continuation of phase-I . However the plots of Gamaria GP also reflects positive trend of improving soil health status. But the initial changes of organic matter and pH indicate the chances of restoration of soil health if the plots remain under organic farming for a couple of years.

SI No	Name of project site	pH range			Organic Carbon	
		Phase I	Phase II	Phase II	Phase I	Phase II
			Season I	Season II		Season I & II
1.	Singerbil GP	6.7	6.8	6.8	> 0.75%	> 0.75%
2.	Chataria GP	6.5	6.6	6.7	> 0.75%	> 0.75%

SI No	Name of project site	pH range			Organic Carbon	
		Initial	Phase II	Phase II	Initial	Phase II
			Season I	Season II		Season I & II
1.	Gamaria GP	6.5	6.7	6.8	0.5-0.75%	> 0.75%

Yield: The yield of organically grown crops seems be better if the practice continue for a period of time . The most needed sustainable production is found only in organic farming . the yield of phase II is better than phase I and the population of natural enemies and beneficial insects has been increasing in the plots of Organic farming.

SI No	Crop	Yield/hec through Organic farming	State average 2011 -12 (Source: State Horticulture Directorate)
1	Cucumber	12.50 MT	11.80 MT
2	Chilli	6.40 MT	6.77 MT
3	Vendi	8.20 MT	8.75 MT
4.	Brinjal	17.50 MT	18.57 MT
5.	Bitter gourd	9.20 MT	9.38 MT
6.	Beans	10.50 MT	10.97 MT

Out come of the Project

The general view on organic farming lies with the belief that it attains lower yields than conventional farming systems. But it is found that the yields from well-managed organic farming practices are almost equivalent to conventional systems. However, the magnitude of the difference depends on climate, soil, and cropping system. The study says that organic farming gives good result in tropical climate. It is also expected that the yield will increase to a substantial level with a time scale. The positive result of the project summarize in following way.

1. Change of mindset : The farmers are motivated and start strongly believing that the production of organic farming is well compatible to the hackneyed chemical based farming. The project has successfully change the mindset of the beneficiaries towards adopting organic farming in their respective plots. It has also inspired neighboring farmers to adopt the technology in a commercial manner.
2. The initiative taken by the Directorate of Biotechnology for the marketing of organic produce of the project area making the beneficiaries confident that higher price can be obtained for the organic produce as the demand for organic crop is increasing day by day .
3. The yield figure of the organically produced crops shows the increasing trend of productivity in a sustainable manner .
4. The nutrient status of the soil has substantially improved.
5. Increase of natural enemies and beneficial insects of the organic plots reflects the positive note on biodiversity and reduction of chemical pollution
6. Enhancement of socio economic condition of the farmers of the projects.

Follow up activities: In order to sustain the organic farming activities by the beneficiaries, Directorate of Biotechnology, Tripura has decided to provide “Biotech Kit” to the beneficiaries and other farmers. The Biotech Kit shall comprise of Liquid biofertilizers, Bio growth promoters, Biopesticides, Biofungicides, Pheromen traps, Knapsack sprayer etc. The entire fund for the Biotech kit shall be borne by the State Government.

Future Activities : As the Phase –I and Phase- II of demonstration programme of Organic Farming has been very successful in achieving the targeted purpose, this Directorate intends to take up another 3-5 hec of land for similar demonstration programme in other uncovered area of the state with the financial support from National Horticulture Board Government of India.