

Case Study

Mushroom Development Foundation

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Governance Knowledge Centre

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Executive Summary

Agriculture is the mainstay of over 80 per cent of population in the northeast region of India. Despite this, farmers in this region remain the most exploited in the entire workforce. Since they do not have organised access to the market, their farm produce is often appropriated by middlemen who deny them a fair price for their produce. The decreasing size of land holdings, high rate of unemployment, low earnings and large social and economic inequalities have contributed to political unrest and economic deprivation in the region.

The potential of mushroom cultivation to provide a serious complementary employment to farmers in the northeast has long been recognised. Realising this, the Mushroom Development Foundation (MDF), a not-for-profit organisation established in 1997 and based in Guwahati, started working towards spawn production, training of farmers, and marketing of mushrooms. MDF has encouraged many small scale agricultural farmers to practice mushroom cultivation to sustain them and created a strong network to further their interest in this agricultural activity. The MDF model follows a cluster based approach in which a Cluster Coordinator supervises a group of about 100 farmers in mushroom cultivation, planting materials and marketing activities. A Cluster Monitoring Committee, comprising of experts in the field, is responsible for all the clusters in the northeast. The farmers are the prime stakeholders and based on their interests, decisions are made to cultivate fine mushroom products. The clusters are also linked to the rural shops for easy access to the market.

MDF is presently working in various villages of Assam, Nagaland, Arunachal Pradesh and Meghalaya. It has plans to replicate its efforts in neighbouring countries such as Bhutan and Bangladesh due to similar climatic and geographic conditions. MDF has given farmers a strong collective voice with which they can negotiate for a minimum price in the market, basic facilities from the government, and loans for expanding their businesses. It believes that the success of mushroom farmers will pave the way for other farmers to organise themselves and demand their rights.

Methodology

MDF's contribution has been crucial in identifying mushroom as a product with sufficient nutrition, conduciveness for growth in northeastern region's climate and, therefore, a market base to prove profitable for small scale farmers. MDF has brought together small scale farmers to engage in an easy and profitable activity, thereby increasing their income as well as providing them a regular employment. It has encouraged simple agricultural practices to support farmers and linked them to the market through a smooth supply chain.

These factors provide sufficient reasons for selecting the MDF as a best practice in livelihood generation. In order to understand the background and working design of the project, thorough desk-based research was conducted. A set of key features and benefits of the project was thus identified. To confirm their credence, the Governance Knowledge Centre team interacted with the founder of MDF and a mushroom cultivator in Sunarpur village of Assam.

Background

Even though agriculture is the primary economic activity in the northeastern region of India, farmers there have hardly been exposed to the market forces. Consequently, middlemen flourish abundantly and work against the economic and social interests of small scale farmers. Farmers comprise over 80 per cent of the region's population and yet are open to extensive exploitation. A major cause for this is the lack of any form of organisation among these farmers. Moreover, the political situation of the region is peculiar wherein utmost emphasis is on the political rights of people and hardly any attention is paid to other significant issues like sustainable livelihood. Further, land holdings are getting increasingly smaller, making it more difficult for marginal farmers to procure produce from their lands so as to last the entire year. Coupled with unemployment, low incomes and high inequalities, these factors are consistently aiding insurgencies in the northeastern states.

The potential of mushroom cultivation to better the economic conditions of people has long been recognised.¹ It requires easy technology, low investments and yields quick returns. However, there had been little initiative in this field in the northeast as was amply evident in no ready availability of spores, sparse technical and informational sources, lack of apt research and development, and inadequate marketing. Moreover, in order to acquire spawns, farmers had to pay a price too high to be economical. Coupled with a general fear of fungi, and mushroom cultivation being a seasonal activity, this reduced their risk-taking capacity. Therefore, despite being suited to the geography and climate of the northeast, mushroom cultivation has not been taken up as a serious economic activity.

Against this backdrop, the Mushroom Development Foundation (MDF) was started in 1997 to organise farmers in Assam for mushroom cultivation. By federating farmers, it has created a system that aims to put an end to farmer exploitation in the northeast region. It gives farmers a strong collective voice with which they can a) negotiate for a minimum price at market, b)

¹ Pranjal Baruah. *Ashoka India*. 2003. Web. 29 December. 2011. <<http://india.ashoka.org/fellow/pranjal-baruah/>>.

request for basic facilities from the government and c) get financial support for expanding farmers' businesses. Farmers are put in control of their produce through land-to-lab strategies, trained and supported as mushroom entrepreneurs. MDF creates new livelihood opportunities for thousands of unemployed youth and landless families in Assam and develops new markets for mushroom consumption. Based on the belief that success of mushroom farmers will pave the way for other farmers to organise themselves and demand their rights, MDF aids mushroom farmers by providing technology, planting materials and market/credit linkages.

MDF has developed systems for every point along the mushroom cultivation chain—from spawn to market. To strengthen farmers' control over their crop and their market, mushroom farmers' network was formed. By standardising price and quality, farmers are given power to collectively demand a fair minimum price.

They also have greater freedom in deciding to whom and where to sell their crop. The Foundation believes that the farmers' unified voice is their only chance at growing their businesses to a point where they can dictate terms of middlemen.

It consists of high-tech mushroom lab to provide a continuous supply of quality seeds at low rates, while his farmer network offers training and a buy-back guarantee as an incentive for farmers to get involved. MDF is establishing strong links throughout the system to grow mushroom cultivation into a sustainable livelihood, especially for the unemployed and the landless poor. MDF is preparing mushroom entrepreneurs in every district of Assam. In addition to running their own farms, these entrepreneurs will motivate, train, support, and coordinate other growers in their geographic area. They provide leadership and technical support to their network of local mushroom growers.

Objective

MDF aims to build a network of small farmers and enhance their capacity to participate in the market economy through mushroom cultivation.

Project Design

MDF's innovation involves simple technology, requires negligible investment, and offers quick returns, which is ideal for the agro-climatic conditions of northeast India. The main component of it is a mushroom business production cum research lab that provides a continuous supply of quality spawns at low rates. MDF prepares entrepreneurs in every district of Assam. Strong links among farmers are enforced throughout the system to grow mushroom cultivation into a sustainable livelihood, especially for the unemployed and the landless poor.

Key Stakeholders

1. MDF is registered under the Societies registration act and its main role is to organise the marginal farming community in north east India to grow mushroom and benefit farmers and the urban to raise their income from INR 500 to INR 4000 a month by 2015 without harming the environment. MDF has established a new economic system to bring together marginal farming community and poor vendors in the urban areas for gaining better negotiating power in the market on a sustainable basis.

2. Protein Food is a proprietorship firm registered under the Ministry of Food Processing Industries, Government of India. The firm carries out the following functions:

- Spawn production in its fully equipped laboratory and production facility at Department of Agriculture.
- With modern processing infrastructure for mushrooms including packaging and marketing facilities.
- 100 percent buy back arrangement and technology support for farmers procuring spawn
- Commercial mushroom growing unit since 1997.
- Developing effective Spawn and mushroom supply chain management system.

MDF employs a cluster based approach to foster the community's participation. Farmers are grouped into clusters in villages to foster innovation, increase income and improve livelihoods. MDF formed clusters so that farmers have a better bargaining power, can draw new resources and investment to an area, and also strengthen the viability of small farms. These clusters are guided under the Cluster Monitoring Committees (CMCs) in every village and their main responsibility is to train farmers in mushroom cultivation and direct them in the market. MDF believes that these clusters can strengthen rural communities within the context of rapidly changing global market place. It aims to establish one market in every village. The founder, Mr Pranjali Baruah, commented that he would like to take the market to the village so that "farmers can produce without depending on land and address economic challenges". The role of a CMC is described in the table below:

Role	Source of Revenue	Heads of Expenditure
Selection of farmers	MDF grant/Farmers' registration fees	Farmers' application and survey
Training	Training fee (optional, MDF grant, farmers registration fees)	Training expenses: resource persons' remuneration, venue arrangement, publicity, , training kit, food/refreshments
Post training	MDF grant/ farmers' registration fees	Cluster Committee (CC) for data retrieving
Market channel development	Pricing	CC remuneration, publicity, CMC meeting expenses
Spawn, raw and planting materials	Pricing, service charge, discount	CC remuneration, cartage, publicity, CMC meeting expenses
Infrastructure	Rent, discount, donation	CC remuneration, materials, publicity, CMC meeting expenses

Research Laboratory

There are various apparatus in the laboratory to increase spawn production and cultivate new varieties of spawn. For instance, an autoclave that acts as a pressure cooker to sterilize the mushroom spawns, bottles in which spawns are grown are sterilized in ovens. Further, laminar airflow apparatus pulls in air through filters and blows out air from the seeds. Inside the apparatus, ultra violet rays are used to kill germs.



FIGURE 1: (CLOCKWISE) OYSTER, BUTTON, MILKY AND SHIITAKE MUSHROOMS

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Work Flow

MDF performs three main roles in mushroom cultivation: a) production of seeds, b) training of farmers and c) marketing of products. Other subsidiary functions include partnering with government/donors to impart training in districts, support women self help groups to build sustainable businesses.

A. SEED PRODUCTION

MDF established a supportive environment for mushroom growing and used mushroom farming as a model to demonstrate a systematic multipronged strategy addressing all facets of organising farmers. Oyster mushroom was chosen as the most suitable variety for cultivation. Requirements for planting mushrooms were easily available, and the technology was simple enough to be easily transferred.

A laboratory known as Protein Food was set up for the purpose of cultivating oyster mushroom seeds. The lab can produce approximately 1,000 packets of seeds each day (100,000 packets in one season). MDF produces high quality seeds and makes them available to farmers at the lowest price in market.

i. RESEARCH ACTIVITIES

Protein Food conducts research and development on various types of Mushrooms. It aims to develop low-cost and effective methods for growing mushrooms as well as to seek out new varieties that can be grown locally. Methods are explored to enable cultivation of oyster mushrooms around the year in order to ensure reliable employment and steady income for the farmers. MDF has converted its own mushroom farm into a demonstration and experimentation site.

ii. OYSTER MUSHROOM PRODUCTION TECHNOLOGY

To start with, the golden yellow paddy straw is washed with clean water and soaked in water tumblers for 12 hours. Secondly, the straws are boiled every half an hour, taken out and dried in the sun. This process is used as a source of food by the mycelium for producing healthy mushrooms. The straws must contain 60 percent moisture. The straws and spawn are then put inside the mushroom compost bag for 15 days with high humidity range of 75-90 per cent and 24 degrees Celsius temperature. The floor needs to be soaked with water to retain humidity and there should be very little light. The mushroom growing room should be pest free. Water must not be sprayed before 24 hours of harvesting.



STEP 1



STEP 2



STEP 3

Training and Support

Initially, only few farmers were part of this foundation; gradually, new farmers are being recruited and trained today. To date, 1,000 growers have been trained on campus and over 4,000 growers off site. MDF conducts one-day training programmes three times a month. These training programmes are open for participation by all after payment of a nominal fee. On an average, each training session attracts 7 to 15 people who learn not only

about the techniques for growing mushrooms but also about the economics of running a mushroom business. The training programme has resulted in approximately 300 medium-sized mushroom farms across Assam that regularly take at least 30 seed packets at a time from the lab and produce an average of 500 kg of mushrooms in a season.

Farmers are required to fill up an application form for selection of mushroom farmers in which their personal details, income status and interests are mentioned and verified by the Cluster Monitoring Committee (CMC). CMC is a professional community representing government, education, business, local leaders and farmers. It acts as a governing and supervisory body working with the mushroom cultivators at the ground level. It maps out plans through discussions with farmers, prioritises their needs and encourages them to cultivate mushrooms. Each CMC comprises of 100 farmers and all farmers contribute INR 2.50 per meeting while every CMC member contributes INR 500. This acts as a fund apart from other donors providing funds to support the foundation.

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MDF plans to develop an advanced training program for trainers and larger growers. These entrepreneurs will be "agents" in bridging the gap between the lab and the small growers. They will streamline the supply of seeds as well as help the lab buy back the produce if the grower is unable to sell it locally. As sole agents collecting commission on both seeds sales and mushroom buy-back, they have a strong incentive to promote growers and to help them succeed. Mushroom entrepreneurs also serve as local troubleshooters for the smaller growers. In addition to running their own farms, these entrepreneurs serve as Community Resource Persons (CRPs) who work to further motivate, train, support, and coordinate other growers in their geographic area. They provide leadership and technical support to their network of local mushroom growers.

B. MARKETING ACTIVITIES

A single packet of spawn, weighing 400 gram and costing INR 30, produces six baskets of mushrooms. One basket of mushrooms weighs around 3 kg. A kg of mushrooms costs INR 80 to 200 in the market, depending on the quality of produce.

In order to increase consumer demand for mushrooms, tMDF started a mushroom awareness drive. MDF promoted mushroom eating at fairs, distributed free samples among people, innovated cooking recipes using mushrooms, made pickles, face packs, powders, and more as well as gained the endorsement of the Assam Literary Society. In this way, MDF succeeded in changing the perception of mushrooms as poisonous. Today, forty-five outlets in Guwahati sell mushroom products under the brand name of "Mushfill". Even though many out-of-state buyers now want to buy these products, MDF is currently focusing on strengthening the local market.



DEMAND ESTIMATION FOR GUWAHATI MARKET	PER WEEK		TOTAL DEMAND	
	NUMBERS	QTY PER KG	PER WEEK/KG	PER ANNUM/KG
RESTAURANTS	15	30	450	2250
FAST FOOD JOINTS	45	14	630	31500
BAKERY	15	20	300	15000
DEPARTMENT STORES, MALLS, GROCERY, SMALL SHOPS ETC	50	50	2500	125000
ANNUAL ESTIMATED DEMAND (EXCLUDING THE PRESENT SUPPLY)				194000

Table: Mushroom market scenario in Guwahati, Assam. Source: Assam Institute of Management 2008

C. PARTNERSHIP WITH GOVERNMENT AND DONORS

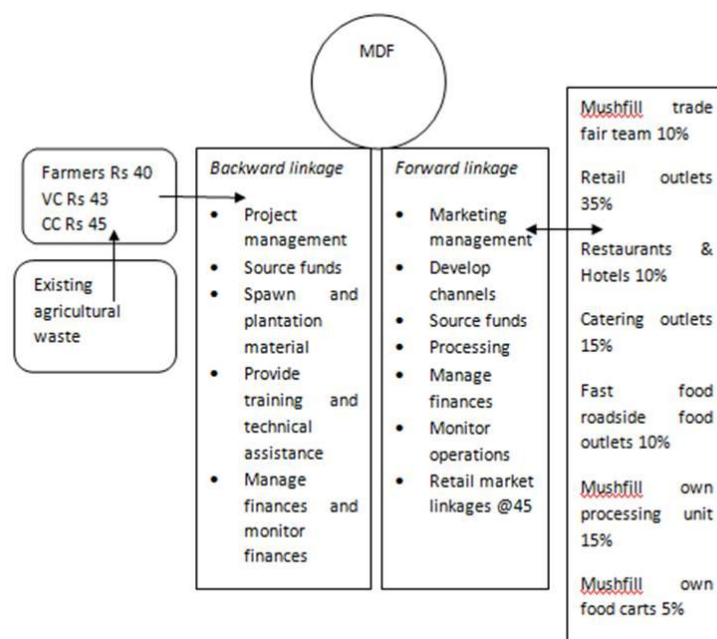
In a recent collaboration with the Assam government, in a project aided by international donors, MDF trained the people of 16 districts in 21 days and distributed over 32,000 packets of seeds.

D. TRAINING WOMEN SELF HELP GROUPS

MDF recently started to work with "mushroom groups" which are self-help groups of women who grow mushrooms collectively in villages. Three such groups grossed over INR 2,00,000 in 2010 and one group succeeded in selling back to MDF mushrooms worth INR 78,000.

Funding

MDF has been given funds by several institutions. It has proposed a business model for its future activities, as is shown in the figure.



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Impact achieved through farmers federation/cluster approach in mushroom cultivation

Note: * Farmers in federation, # Infrastructure/RM developed for farmer's federation building

	NAME OF SCHEME SPONSORSHIP	YEAR	AMOUNT SANCTIONED	UTILISED
1.	CLARENCE FOUNDATION	2005-06	6.51 LAKHS	YES
2.	NEN, GUWAHATI	2006-07	2.51 LAKHS	YES
3.	NABARD	2007-08	0.10 LAKHS	YES
4.	SIRD	2007-08	0.25 LAKHS	YES
5.	ASTEC	2007-08	0.20 LAKHS	YES
6.	RUTAG	2008-09	0.50 LAKHS	YES
7.	FST, GUWAHATI	2008-09	2.84 LAKHS	YES
8.	DEPARTMENT OF HORTICULTURE, TECHNOLOGY MISSION, GOVT OF ASSAM	2009-10	2.50 LAKHS	YES
9.	FOUNDATION FOR SUSTAINABLE DEVELOPMENT USA	2009-10	2.75 LAKHS	YES
10.	FOUNDATION FOR SUSTAINABLE DEVELOPMENT, USA	2009-10	2.75 LAKHS	YES

YEAR		COVERAGE								
1995-2005		<ul style="list-style-type: none"> PRODUCED FROM 20,000 KG TO 6, 00, 00 KG PER ANNUM OF MUSHROOM IN NORTH EASTERN REGION. INVOLVED HOST OF COLLABORATORS; REACHING OUT TO 3000 SMALL FARMERS. CREATED AWARENESS AMONG LAKHS OF FARMERS ACROSS NORTH EAST, BHUTAN, NORTH BENGAL AND BANGLADESH. 								
YEAR	NO. OF FARMERS TRAINED, GIVEN SPAWN AND GIVEN FREE PLANTING MATERIAL	TOTAL FARMERS UNDER FEDERATION	INCOME BEFORE TRAINING/MONTH	INCOME AFTER TRAINING/MONTH	FREE SPAWN TO FARMERS	CONTRIBUTION (GRANT IN AID)	TRAINING APPLICATION	AREAS ADDRESSED	TRIBES BENEFITED	
2006	201*+863	201	516	800	201	1,79273+4,72,027#	1500	SONAPUR, BARPETA, KARBI ANGLING, LAKHIMPUR AND GARO HILLS	BORO, RABHA, TIWA, GARO, DEURI	
2007	857*+630	1058	690	850	1058	2,41,500	1700	SONAPUR, GARO HILLS, PASIGHAT, NAGALAND AND ARUNACHAL PRADESH	BORO, RABHA, TIWA, GARO, DEURI, ADI, APATANI, SEMA & TANKHUL	
2008	200*+540	1258	790	1215	1258	1,00,000 +11,00,000#	1500	SONAPUR, GARO HILLS, MAKUM, KHASI, NIRJULI AND BOKO	KHASI, GARO, MORAN, MOTOK, DEURI, SUTEYA, BORO, ANGAMI, RABHA, KARBI, NISHI, GALO ADI	

Formation of mushroom clusters in Assam, Meghalaya, Arunachal Pradesh and Nagaland

STATE	DISTRICT/CLUSTER	NO. OF FARMERS
1. ASSAM	a. TINSUKIA	
	i. MAKUM	120
	ii. DIGBOI	100
	b. GOLAGHAT	
	i. MERAPANI	100
	ii. KAMARGOAN	100
	c. KAMRUP	
	i. DIMORIA	180
	ii. CHANDRAPUR	80
	iii. BOKO	60
2. MEGHALAYA	a. EDENBARI	40
	b. DAMALGRE	60
3. NAGALAND	a. KHONOMA	100
4. ARUNACHAL PRADESH	a. NAHARLAGUAN	100
	MALE FARMERS BENEFITED	800
	FEMALE FARMERS BENEFITED	1200
	ST/SC	1500
	MINORITIES	350
	OTHERS	150

Mushroom cultivation prospects

There are several benefits attached to mushroom cultivation in northeast as its climatic conditions are conducive for its growth. Mushroom cultivation requires minimum investment in planting materials and has maximum profit potential in the market. It is easily cultivable and requires small land holdings for cultivation. It is rendered viable as there is abundant availability of raw materials such as paddy straw.

Mushroom cultivation is an ideal tool to build up a strong network among the farming communities for a stronghold of the market. The remaining compost can be used in the traditional crop for optimum production.

Conclusion

MDF has introduced mushroom cultivation technique in the northeast through sensitisation, awareness and training including skill up gradation and all of this has been designed in a simple way so that the farmer finds it easy to understand. Training comprises of practical demonstration with audio visual demonstration along with theory and technical guidance.

The foundation has ensured easy availability of quality planting materials at the farmers door step at affordable price. It has developed well equipped spawn laboratory facility to constantly update technology and produce good quality of spawn. It has organised farmers in clusters to give them a collective voice over their production and marketing ventures.

With all such efforts, MDF has managed to unite small scale farmers to engage in traditional farming of mushrooms and participate in business and earn livelihood.

Research was carried out by OneWorld Foundation India (OWFI), Governance Knowledge Centre (GKC) team.

*Documentation was created by Research Associate, **Attrika Hazarika***

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Appendix A – Interview Questionnaire

Background- Stakeholders and roles

1. According to our research, the major stakeholder in this project are :
 - a) Mushroom Development Foundation
- i. What are their specific roles in this project?
- ii. Are there any other stakeholders? If yes, who are they? What are their roles and responsibilities?

Evolution

2. We understand that MDF aims to strengthen the farming community of Assam by engaging in mushroom cultivation. It gives farmers a strong collective voice with which they can:
 - a) Negotiate for a minimum price at market,
 - b) Request for basic facilities from the government
 - c) Get financial support (loans) for expanding their businesses.

It believes that the success of mushroom farmers will pave the way for other farmers to organise themselves and demand their rights.

- i. Why was it conceptualised?
- ii. When did the actual implementation begin?
- iii. What are its objectives?
- iv. What are its advantages?
- v. Did it face challenges? If yes, what are they?
- vi. What is the coverage plan in future?

Workflow

3. According to our research, MDF engages in: a) seed production b) training of farmers and c) marketing activities.
 - i. Explain each process in detail.
 - ii. Which agency has funded each process?
 - iii. Which agency facilitates seed production, training and marketing activities?
 - iv. What is the total number of staff and how much do they get paid?
 - v. Is any technology being used in this cultivation? If yes, what is it?
 - vi. Mushroom products are sold under the brand name of “Mushfill” in Assam. What is the annual turn out and where all do the products get sold?
 - vii. What factors determine good quality of mushrooms?

Impact and Sustainability

4. MDF's goal is to alleviate poverty amongst small farmers, fight for their rights and provide support to expand their business.
 - i. Has it been successful in achieving all its goals? If not then, why?
 - ii. Are there any other goals? If yes, what are they and has MDF been successful in achieving them?
5. How many human resources have been integrated in this project? Has there been an increase in the number since the initiative started?
6. How has the initiative sustained itself financially?
 - a. Is there a revenue generating mechanism? If not, then who is funding the project?

Measuring success

7. What are the innovative features of the project?
8. To what extent can this project impacted lives of mushroom producers and consumers?