

## **Developing small production and marketing enterprises: mushroom contract farming in Bangladesh**

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## **Summary**

This article presents a case study of an activity implemented under the FAO component of the Local Partnerships for Urban Poverty Alleviation Project funded by UNDP in Bangladesh. In Mymensingh city, the project is linking poor urban dwellers with a small Bangladeshi niche market for oyster mushroom. This small enterprise development activity of the project appears to be sustainable in the fact that it develops the agricultural production enterprise to cater for the specific demand of an existing small marketing enterprise. As long as the trader finds a market for his mushroom, he is encouraged to collaborate with the project beneficiaries who supply the raw produce to him. This model is thus an example of mutual benefit between extremely small landholders and a trader through the catalytic effect of a development project.

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### **Introduction**

In recent years, development research has seen an increased focus on helping farmers respond to the challenges of linking to dynamic markets (Vorley et al. 2007, Reardon and Timmer 2007). This goes in parallel with efforts from development practitioners around the world to help small producers link to markets. Publication of the success stories and lessons learned from such initiatives is providing useful material to develop approaches to linking producers to markets, and in particular on the type of market linkage that is most appropriate considering the context of the farmers involved and market to supply (Ferrand et al. 2004, Bernet et al 2006, KIT et al 2006, Shepherd 2007).

When development projects or non-governmental organisations (NGOs) attempt to link farmers with markets, the long-term sustainability of the link created is to be assessed before any implementation is done (Shepherd, 2007). Indeed, too many project beneficiaries have seen their markets disappear when the project that was helping them closed, simply because the project had become their market outlet! One way of securing market outlets for small agricultural enterprises is to collaborate with private traders already present in the market and help the project beneficiaries become essential partners for these traders.

This article presents the case study of such a link between a trader and beneficiaries of the FAO component of the Local Partnerships for Urban Poverty Alleviation Project (LPUPAP) funded by UNDP in Bangladesh.

The article first reviews the literature for recent publications reporting work on linking farmers with markets. The second section briefly presents the FAO project and the farmers benefiting from this project activity before introducing their market outlet in the form of Abdul Kadir, the mushroom trader. The linkage activities provided by the project staff are then described along with the training and support services given to the farmers. The results of this small enterprise development project are reviewed before concluding on the lessons learned and distinct features of this success story.

### **Recent findings on linking producers to markets**

The worlds' food distribution systems have undergone major changes in the last decade with the rise of supermarkets in industrialised and developing countries, the signing of multilateral, regional and bilateral free trade agreements that include agricultural products, and the emergence of global food supply chains (Berdegué et al. 2005, Hernández et al. 2007). All these developments have been characterized as a major regoverning of the marketing linkages between farmers and other stakeholders in agro-industries (Vorley et al. 2007).

To keep up with these new developments, recent years have seen strong research interest in understanding how these new supply chains work, who are the stakeholders involved in them and who is emerging as chain leaders (Poole et al. 2003, Chen et al 2005, Moustier et al. 2006, Batt and Cadilhon 2007, Vorley et al. 2007). Recent findings show that the right policy environment is necessary to create incentives for private businesses to enter these emerging markets but also to make sure that their development does not have a negative effect on sustainable rural and urban livelihoods. With the right organisation or market intermediary to link farmers into these new food supply chains, there are clear benefits for farmers and in particular smallholders. This new literature also identifies the importance of a long-lasting and trusting relationship in the marketing linkages. Building upon these lessons, governments and development agencies are increasingly active in supporting farmers gain access to income-generating markets (Ferrand et al. 2004, Bernet et al 2006, KIT et al 2006).

When analysing the different approaches to linking producers to markets, Shepherd (2007) notes that many of the linkages created by development practitioners are not sustainable because some poor farmers are unable to adhere to the demanding requirements of their customers. The institutional environment around them is found to be inadequate, or the marketing relationships between the various stakeholders in the supply chain not conducive to a sustainable marketing chain. Although development practitioners may agree in principle on the necessity of fostering market-driven agribusiness enterprises and services, Caniëls et

al. (2006) show how putting theory into practice is made difficult by the wariness of development projects against private sector suppliers and customers.

However, the private sector is undoubtedly recognised as being a major driver for sustainable market linkages for small producers (Caniëls et al. 2006, Batt and Cadilhon 2007, Shepherd 2007, Vorley et al. 2007). Because it is in their own business interest to develop a reliable supply base, agricultural traders can play a pivotal role in organising farmers into groups and helping them plan production systems so as to adhere to the quality requirements demanded by ever changing agri-food markets. The positive role played by private traders, which had already been identified by anthropologists (Rigg 1986), is finally getting recognition among development economists and practitioners. Drawing from these lessons, the FAO component of the LPUPAP in Mymensingh City of Bangladesh has introduced a market-based approach which will ensure a sustainable market link for the project beneficiaries through a partnership with a trader.

### **The project**

Bangladesh is a densely populated country with 880 persons per square kilometre: the annual rate of increase of the population is currently 2.17 percent (Bangladesh Bureau of Statistics 1996). However, the population growth rate is even higher in urban and peri-urban areas and it is further fed by the migration of rural populations into the cities. This migration has resulted in a large class of urban poor. The FAO component of the LPUPAP has taken initiatives to produce or supply adequate amounts of food for the increasing urban population of Bangladesh. To achieve this, the project means to ensure a sustainable utilisation of land and natural resources in both urban and rural areas for a diversified production of food items. In this context, the project has undertaken urban and peri-urban agriculture (UPA) extension activities in six towns of Bangladesh: e.g., homestead and commercial vegetable production, plant and flower nursery, commercial flower cultivation, composting, mushroom production and marketing, pond fish culture, integrated fish culture, native catfish rearing, poultry rearing, poultry vaccination, native duck, pigeon and quail rearing, goat rearing, cow rearing, cattle fattening, bee keeping, puff rice production and marketing.

Among these UPA interventions, mushroom production and marketing is one of the potential interventions which can create income options for the urban poor. The project has introduced a market-based approach which will ensure a sustainable market for the beneficiaries. Some poor communities in Mymensingh city have been linked with a local private trader to supply oyster mushroom to him, and through him, to a relatively small but secure Bangladeshi niche market. Thus, it is expected that when the project support comes to an end the beneficiaries will be able to run their enterprise independently.

### **The farmers**

Fifty-five producers grow oyster mushroom in Mymensingh town, located 115 km north of Dhaka, the capital city of Bangladesh. Twenty of these are poor households grouped into three mushroom marketing groups by the LPUPAP. Seventeen out of these twenty households receiving project assistance are represented in project activities by the housewife. The households have access – whether formal or informal – to small plots of land next to their houses. Mushroom production does not require much space: a clean, semi-dark and ventilated room with shelves is all that is needed.

The inputs into the production process are mushroom spores, bamboo shelves, water to pour onto the mushroom cultivars, and formaldehyde to clean the production room. The mushroom is grown out of plastic bags containing spores and the nutrient base. Each plastic spore bag weighs around 700–750 g and all bags are placed onto the shelves. Up to 300 bags can fit in a shelf space as small as 2 m<sup>2</sup>. Harvest starts seven days after the start of the culture and can last four months; each bag of spores can produce an average 1.5 kg of oyster mushroom.

Table 1: Producers' costs and sales per bag of oyster mushroom in Mymensingh, Bangladesh

Item	Value per bag (Tk)
Bag of <i>Raj Mushroom-Dhaka</i> spores bought from trader	14.00
Shared costs of purchasing formaldehyde, hand gloves, knives, polyethylene bags, consumer promotion leaflets	4.00
Sales of mushroom	150.00
Net profit	132.00

Source: Authors' calculations. NB: At the time of study US\$1 = Tk68.

Although bags of locally-produced mushroom spores only cost Tk10 (US\$0.15), the quality of these spores is not as good as those coming from Dhaka. Therefore, to guarantee a high sale price for its beneficiaries, the project has encouraged the producers to buy the *Raj Mushroom-Dhaka* spores.

### The market

Oyster mushroom is not a traditional food product in Bangladesh. It is still a relatively small niche market of educated urban households, institutional buyers such as NGOs, big mushroom farms, Chinese restaurants, and university, college, school and cantonment canteens or expatriates in Dhaka. Table 2 gives an estimate of the oyster mushroom market in Bangladesh.

Table 2: Estimated market for oyster mushroom in Bangladesh

Location	Number of farms (approx.)	Number of customers (approx.)	Average weekly purchase (kg)
Mymensingh	55	2 500	550
Dhaka	250	12 500	2 500
Savar	175	7 500	1 400
Bangladesh	875	60 000–75 000	12 000–15 000

Source: Personal communication from Abdul Kadir, Executive Member of the Mushroom Foundation, Dhaka, Bangladesh. NB: Figures comprise both fresh and dry mushroom, all converted into fresh mushroom (10 kg of fresh mushroom are needed for 1 kg of dry mushroom). The sum of individual lines does not add up to the total country figure because of the approximation.

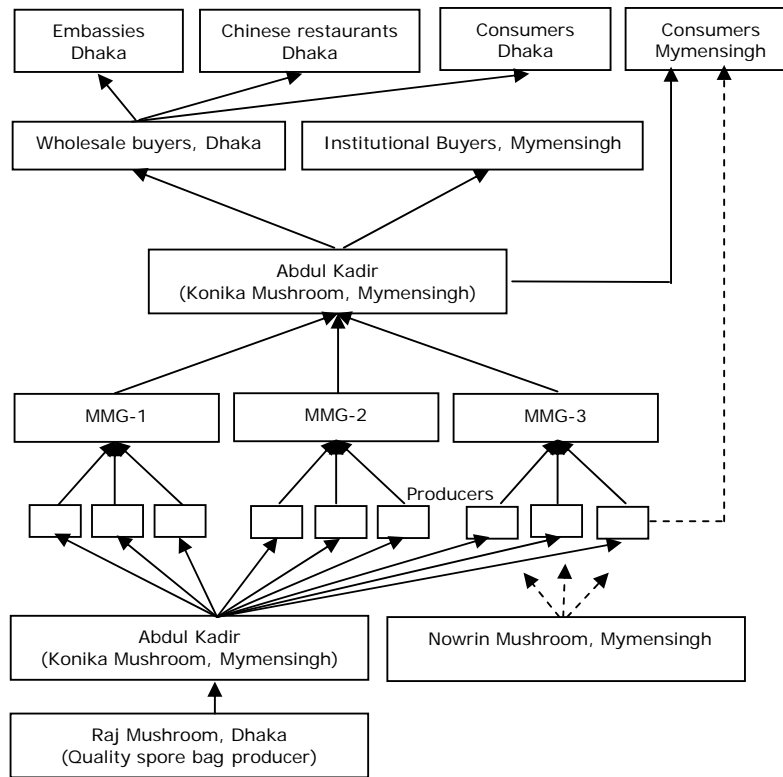
Abdul Kadir is a trader based in Mymensingh; he owns Konika Mushroom Ltd. Apart from producing mushroom, supplying spores and buying mushroom from producers, Abdul Kadir also provides training on mushroom culture, technical support, and processes dry mushroom. He is a member of the Bangladesh Mushroom Foundation. He is the market outlet for 40 mushroom farmers including the 20 supported by the LPUPAP. Abdul Kadir started mushroom cultivation in 2004. He had just lost his job and had fallen into economic stress while unemployed. His daughter Kakoli got information from a friend on mushroom culture and shared this information with her father. He then communicated with the Mushroom Development Centre in Dhaka and eventually received training on mushroom culture from *Rongdhonu Mushroom* in Savar. He started a small-scale production business and created his own market for his mushroom. Five salesmen work with him to market the mushroom. Each salesman earns from Tk900 to Tk1 400 (US\$13.25–20.60) per month from sales commission. Abdul Kadir transacts 60 kg of fresh mushroom and 15 kg of dry mushroom to his local and Dhaka city customers every week. His monthly net income is nearly Tk15 000 (around US\$220). However, he can not fulfil the demand of his big buyers such as Palli Seba Sangstha, Rongdhonu Mushroom and Raj Mushroom companies.

Thus, Abdul Kadir has linked with the LPUPAP project in order to increase his mushroom production base. He collects around 10 kg of mushroom every day from the contract farmers, which he sells to his Mymensingh customers (4kg/day) and to Dhaka (from 15 to 20 kg every other day). He also supplies the spore bags to the project farmers. He travels the two-hour drive to Dhaka to buy the *Raj Mushroom-Dhaka* spore bags at Tk10/bag (US\$0.15); he sells the spore bags to the project beneficiaries at Tk14/bag (US\$0.21) thus making a gross profit of Tk4/bag (US\$0.06) which covers the transport costs of Tk1.5/bag (US\$0.02). Other

suppliers of mushroom spores are *Nowrin Mushroom* and the Horticulture Training and Development Centre (HTDC) under the Department of Agricultural Extension (DAE). (1)

However, there is no explicit requirement from mushroom buyers as to the size of the mushroom they buy or the type of spores to be used for mushroom production. Figure 1 presents the different stakeholders involved in this oyster mushroom marketing chain, as identified in February 2007.

Figure 1: Supply chain map of oyster mushrooms produced in Mymensingh – February 2007 situation



Legend  
 MMG: Mushroom marketing group  
 → Most important marketing channel  
 -→ Less used marketing channel

### The link between the farmers and the market

The LPUPAP is implemented by the Local Government Engineering Department of the Government of Bangladesh. At the local level, the project staff members are inserted into the services of the local government, in this case the Mymensingh *Pourashava* (Town Council). The local LPUPAP staff has identified the opportunity for a partnership between Mymensingh poor households and Abdul Kadir to become a stable, long-term mutually beneficial collaboration. The Agricultural Extension Officer of the LPUPAP-FAO Component in Mymensingh knows Abdul Kadir because they live close to each other. The LPUPAP has asked Abdul Kadir to collaborate with the project by training its beneficiaries while enabling him to enlarge his production base. The project has negotiated a purchasing price with the trader: Abdul Kadir will buy the fresh mushroom from the producers at Tk100/kg (US\$1.47), paid in cash.

The project works as a facilitator, not a market actor. Furthermore, the project has an exit plan. Indeed, only five interested poor project beneficiaries initially got project support for

demonstration purposes on mushroom production. Further project beneficiaries were later helped to start their own mushroom production activity. Producers must then bear all the costs of establishing and operating the mushroom production. Creating the link with Abdul Kadir as the market outlet for the project beneficiaries is also part of the exit strategy as the trader will remain even though the project may eventually come to an end.

Twenty new farmers have joined the first five project beneficiary households in mushroom production. Twelve of these farmers harvest mushroom and sell their produce through Abdul Kadir. In addition, they also try to develop local consumption and market some fresh mushroom to local consumers directly. On average, each farm produces 3–4 kg of fresh mushroom each week and still does not face any marketing problem.

### Training and support services

Both the project and the trader provide training on production techniques to the producers. The FAO component of the LPUPAP has organised a technical training study tour to Dhaka for the beneficiaries. The project has also supported the start up activities of their enterprise by providing some critical inputs for them to follow the demonstrated production techniques: plastic hand gloves to wear when cleaning the production room and the sealing machine to seal the mushrooms into plastic bags (see Table 3). The project also provides signs and prints out leaflets to advertise oyster mushroom to local consumers; this is an attempt to develop the local market for mushroom.

Table 3: List of critical inputs provided to beneficiaries of the FAO component of the LPUPAP through the demonstration programme

Items provided	Quantity
Hand gloves	2 pairs per producer
Formaldehyde	1 bottle per producer
Mushroom spore bag	50 per producer
Hand sprayer	1 per producer
Polyethylene bag (250 g size)	250 per producer
Consumer promotion leaflet	250 per producer
Project beneficiary signboard	1 per producer
Weighing machine	1 for 5–7 members of the small mushroom marketing group
Sealing machine	1 for 5–7 members of the small mushroom marketing group

Source: LPUPAP

Furthermore, the project staff and Abdul Kadir are essential in training the farmers on keeping a focus on high-quality mushroom production. Such training includes:

1. Building awareness of the quality of the spores to obtain good quality mushroom. The Project does not wish to compromise the quality of the mushroom by promoting lower-priced spore bags. The LPUPAP is currently developing linkages to collect spore bags directly from *Raj mushroom* in Dhaka, who are renowned for producing quality mushroom spore bags.
2. Assistance and advice to the farmers on building the production room and maintaining by themselves the ideal environment for mushroom growth.
3. Improving the beneficiaries' knowledge of hygiene issues.
4. Providing technical support for production, harvesting and quality issues through hands-on training and regular follow up. Abdul Kadir makes regular visits to his contract farmers and provides technical advice to them as an embedded service to his supply of mushroom spore bags.

The product requirements specified by Abdul Kadir are straightforward: the mushroom should be fresh, clean and the polyethylene bags labelled. If the mushroom harvested by the farmers is not fresh enough, Abdul Kadir advises the producers to dry the mushroom for the dry mushroom market.

Thus, the farmers pre-pack the mushroom in polyethylene bags before they sell their produce. Bags destined to Abdul Kadir contain between 250 and 500 grammes of mushroom whereas bags to be sold directly to local consumers contain either 100 or 250 grammes of produce. Both types of bags display a label which enables the produce to be traced back to its production site as well as the date of packaging. The mushroom bags sold to Abdul Kadir display the following caption: "This mushroom is a product of the FAO-supported group *Jhinuk Mushroom Producer Group* and marketed by Abdul Kadir of Konika Mushroom, Mymensingh". All the bags prepared for direct marketing contain a paper leaflet inside the bag. The first side of the leaflet displays the name of the production farm, the name of the mushroom producer group, the name and contact address of the producer, his or her mobile phone number, and the name of the assisting agency (FAO-managed Agricultural Extension Programme of LPUPAP, Mymensingh). The other side of the leaflet contains information on mushroom consumption: What is a mushroom? What are its nutritional and medicinal qualities? Ten different mushroom cooking recipes are also suggested.

### **The results**

With a selling price worth Tk100/kg (US\$1.47) of produce, an average 1.5 kg of mushroom per bag of spore, a maximum of 300 bags on 2 m<sup>2</sup> of shelf space, and production costs estimated at Tk9/kg (US\$0.13) of produce, oyster mushroom producers can make a minimum profit of Tk132 (US\$1.94) for every bag of spores they purchased at Tk14 (US\$0.21) per bag.

The maximum profit for the production system described above can thus reach Tk40 000 (or around US\$590) per producer over a period of four months! This is not negligible for low income urban dwellers with some land to dedicate to agricultural production. The trader Abdul Kadir also makes a profit on each transaction with the producers.

As 85 percent of the direct beneficiaries of the project's mushroom development activities are women, this experiment has showed that women can be involved successfully in a small cash-generating enterprise. Before being involved with mushroom production, the majority of the female farmers spent most of their time on household activities. The proceeds from the sales of mushroom are now kept by these female farmers, which they use to meet their family needs. Furthermore, all the project's mushroom farmers are now maintaining accounts and keeping records of their small enterprise.

### **Lessons learned and distinct features**

The model implemented by the FAO Component of the LPUPAP linking poor urban dwellers of Mymensingh city with a small Bangladeshi niche market for oyster mushroom appears to be sustainable post-project as it uses a trader as an intermediary between farmers and markets. As long as Abdul Kadir finds a market for his mushroom, he is encouraged to collaborate with the project beneficiaries who supply the raw produce to him. The project is helping to enlarge his market by advertising the mushroom production to local consumers and by printing leaflets on how to cook them. Abdul Kadir currently still can not fulfil the demand of his customers for both fresh and dry mushrooms. Through discussions with him, the project staff has found out the extent of the gap between supply and demand. This information facilitates the production plan for the project mushroom growers. Each week Abdul Kadir is able to supply an additional 40 kg of fresh mushroom and 4–6 kg of dry mushroom to his institutional buyers based in Dhaka thanks to his partnership with the LPUPAP beneficiaries.

As the oyster mushroom market is clearly a niche market, the project is very careful about extending the number of farms producing mushroom or even increasing the number of spore bags grown by each beneficiary. Based on the demand of the partner trader, the project's mushroom farm numbers and size may be expanded in the future. However, the current plan is to limit the farm numbers to 20 households with an average production size of 200 spore bags per producer.

This model is thus an example of mutual benefit between extremely small landholders and a trader through the catalytic effect of a cautious development project. From its inception, the LPUPAP has encouraged community-based savings and credit activities so, except for the extreme poor on behalf of whom the small investments are currently supported by the LPUPAP, investment costs are borne by the producers; this further increases the sustainability of this micro-enterprise development model. (2) The mushroom production ventures of the

20 households has already led to the creation of a new enterprise: one of the project mushroom farmers named Najrul Islam has started trading inputs and mushrooms like Abdul Kadir to respond to the demands of mushroom consumers and of the mushroom producers in his community. Thus the project activities have created some market competition through endogenous growth: the project farmers now benefit from the competition existing between the two traders.

The mushroom activities described are now running with limited support from the project, which treats the mushroom production and marketing intervention as one of its successful and sustainable initiatives. The project is thus currently replicating the mushroom experience of production and marketing by supporting other agribusiness development service enterprises (livestock vaccination, commercial floriculture and milk-marketing) in other Bangladeshi peri-urban settings around the cities of Rajshahi, Bogra and Barishal.

Furthermore, the project experienced that urban female farmers who are educated and have some investment capacity are more interested to get involved in mushroom production compared with other city dwellers. In Mymensingh, the mushroom farm size ranges between 50 and 350 mushroom spore bags, it is therefore manageable for women in addition to their household activities. The wives of the male farmers involved in the project mushroom activities also assist their husbands in managing the farm. When travelling on study visits between project sites and seeing the results achieved by the group of beneficiaries in Mymensingh, many female beneficiaries of the project from other cities have expressed interest in mushroom production for their own home consumption and income generation. To address this demand, the Mymensingh project team will organize a 2-day long hands-on training on mushroom production and marketing for female project beneficiaries from other cities.

The replication of this model of small agro-enterprise development to other cities in Bangladesh thus looks very promising. Indeed, the initial land and financial capital resources needed are relatively small and the production techniques involved are within the reach of individuals with no particular agricultural background. However, the essential precondition for any successful replication of this case is the development of the marketing link with a trader, which should be done prior to or in parallel with the support given to mushroom production. It is this collaboration between development project and private trader which provides the sustainable link for the beneficiary farmers to the market.

More importantly, this case study argues for looking at private traders under a more favourable light as sustainable partners for the inclusion of smallholder producers in agri-food marketing chains. Agricultural traders have long been stereotyped as exploitative middlemen who unfairly profit from selling the produce of farmers. This negative viewpoint should be tempered by acknowledging the useful roles played by agricultural traders within supply chains (Batt and Cadilhon 2007, Rigg 1986, Shepherd 2007). Traders bear the costs of functions which farmers and consumers do not want to, or cannot implement: collection, organising transport, finding market outlets... All these activities entail risks which have to be hedged by somebody in the marketing channel. Those with the most cash flow in the supply chain are the best suited to do so.

Furthermore, private traders can help farmers and farmers' groups to link with markets by collaborating with them in order to supply goods that will satisfy the quality requirements of their final customers. It is in the explicit interest of traders to lower their costs and add value to their products in order to satisfy their customers and consumers. Thus, outsourcing such labour-intensive activities as cleaning, trimming and packing to suppliers is in the best interest of trading intermediaries in order to sell products with exactly the right quality attributes directly to their customers. It is also in the interest of farmers as such post-harvest processes add value to produce and enable producers to capture a more remunerative price for their products.

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#### Endnotes

(1) The mushroom cultivation techniques have been developed in the Mymensingh HTDC under the FAO-UNDP supported "Integrated Horticulture and Nutrition Development project".

(2) One year after the time of study, the LPUPAP has closed to be replaced by the UNDP-funded Urban Partnerships for Poverty Reduction Project (UPPR).

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