

CASE STUDY

Improving Yield and Quality of Mung Beans in Bangladesh



A project in Bangladesh helped farmers move from subsistence farming to growing export-quality mung beans. Photo credit: euglena Co., Ltd.

Production and export of high-quality mung beans can improve farmers' incomes and nutrition.

Overview

Japanese biotechnology company euglena Co., Ltd. (formerly Yukiguni Maitake Co., Ltd.) started a project to grow mung beans for bean sprouts to ensure stable supply through diversification of supply chain, as well as increase Base of the Pyramid (BoP) farmers' income in Bangladesh.

To develop the project, euglena established a joint venture, Grameen Euglena (formerly Grameen Yukiguni Maitake Ltd.), in cooperation with Grameen Krishi Foundation in Bangladesh and Japan's Kyusyu University.

To determine the potential for business development, a preparatory survey was conducted through the Preparatory Survey for BOP Business Promotion scheme of the Japan International Cooperation Agency (JICA). With JICA's support, the preparatory survey focused on setting up the organization for

exporting mung beans to the Japanese market and developing instruction methods for improving farmers' cultivation skills.

Through the preparatory survey, Grameen Euglena provided agricultural techniques to BoP farmers in order to grow high-quality mung beans. Harvested mung beans were purchased by Grameen Euglena at higher than the market price, and some were exported and distributed to bean sprout retailers in Japan. This contributes to an increase in farmers' income and in employment, especially for women, as well as improvement of nutrition by selling the rest of the mung beans at low prices in Bangladesh. Also, Grameen Euglena reduced pesticide residue, bacteria, fungi, and other risks; and ensured a stable supply of high-quality mung beans.

Project snapshot

Dates	<ul style="list-style-type: none">• December 2011: Approval Date• February 2014: Completion Date
Institutions and Stakeholders	<ul style="list-style-type: none">• euglena Co., Ltd. (formerly Yukiguni Maitake Co., Ltd.), Grameen Euglena (formally Grameen Yukiguni Maitake Ltd.)• Japan International Cooperation Agency (JICA)

Challenges

?Economic disparity between rural and urban areas

Although poverty ratio is decreasing in Bangladesh, there is still economic disparity between rural and urban areas. Measures should be taken to address this.

In Bangladesh, 48% of the total workforce is engaged in agriculture. About 70% of the country's population lives in the rural area, and faces poverty. Moreover, about 60% of households in rural areas do not have access to sufficient amount of land to maintain their subsistence. In many cases, farmers work on land they do not own at very low pay. Therefore, they cannot afford to pay for unexpected expenses when diseases, injuries, and natural disasters happen. As a result, they often fall into extreme poverty.

As for public services, such as education and health, well-off people benefit from these services, while poor people lack access to them. Thus, economic disparity creates social differences as well as discrimination.

Inefficient agricultural methods

Given the remoteness of rural areas and difficulties in acquiring information, there is no opportunity to learn the latest techniques. Sometimes there are training sessions in the rural areas; however, only community leaders can take the training, or the training material cannot be utilized due to low literacy

rates. Therefore, farmers have no choice but to keep conventional practices.

Solutions

This project contributes to decreasing poverty in rural areas through creation of employment, as well as increasing crop yields and quality by introducing Japanese agricultural methods, and purchasing crops at adequate price. The pilot project for mung bean production and its evaluation were conducted from 2012 to 2013.



The mung beans have to be more than 3.5 millimeters in diameter in order to meet quality requirements for bean sprouts. Photo credit: euglena Co., Ltd.

Business model

euglena provides Grameen Euglena with financing and technologies for producing high-quality mung beans. Grameen Krishi Foundation provides Grameen euglena with microcredit schemes for farmers to buy seeds, and support for establishing farmer networks.

With the support of euglena and Grameen Krishi Foundation, Grameen Euglena employs contract farmers, and teaches them to produce high-quality mung beans. Harvested mung beans are purchased by Grameen Euglena at higher than market price. Adequate-sized mung beans for producing bean sprouts are selected and exported to Japan. The rest of the mung beans are sold at cost in Bangladesh. This contributes to the improvement of nutrition in Bangladesh.

Skills development

Cultivation guidelines were developed based on interviews with Japanese suppliers and research. These prescribe the agricultural methods that are essential for proper cultivation of mung beans. These methods include line sowing, irrigation, weeding, and hilling.

Grameen Euglena trained field supervisors, who took charge of instructing farmers in their areas.

Quality control

The project also introduced an information and communication technology (ICT) system for monitoring cultivation conditions. The system records data shared between Japan and Bangladesh in real time.

Field supervisors monitored the system's utilization.

During post-harvest operations, dust was manually removed from the mung beans by farmers, mostly women. Machinery for the screening process was introduced to improve efficiency.

Lot management of mung beans was also implemented to ensure traceability.

Results



Women farmers remove dust from mung beans. Photo credit: euglena Co., Ltd.

Based on results of the preparatory survey, business development of mung bean's mass production was evaluated as feasible even though problems, such as the weather and risks of plant disease, remained. Farmers who participated in the project have acquired technical skills for cultivating high-quality mung beans, allowing them to improve their unit crop yield and quality, which leads to higher incomes. One positive case shows that in Season 1, a farmer in west region doubled his harvest and increased the purchase price by 1.5 times compared with the previous year.

In 2012 and 2013, Grameen Euglena exported about 40% of the mung beans it purchased and sold the rest in Bangladesh at the original price to help improve nutrition of local people. By cultivating mung beans under its management, euglena reduced pesticide residue, bacterial, fungi and other risks, and ensured a stable supply of high-quality bean sprouts.

During the preparatory survey, an average of 7,500 contract farmers were involved in 2012 and 2013. Furthermore, women were actively involved in this project, participating in the dust removal and screening process, and in selling the mung beans.

The results of this survey was used as baseline data in business development. At the stage of business expansion, the number of contract farmers is expected to increase to more than 10,000. Thus, the benefits that this project brings to BoP farmers have been significant.

Upon completion of the preparatory survey, the selection of project locations, formulation and implementation of training programs for field supervisors, and improvement of quality control during the screening process have continued.

The growth in mung bean production has rapidly increased. In 2015, 1,500 tons of mung beans were harvested and half of them were exported to Japan.

Lessons

This project shares lessons on establishing a value chain to meet quality requirements of the international market.

Effectively communicate guidelines to farmers

To meet quality standards of the Japanese market, the mung beans have to be more than 3.5 millimeters in diameter. In Season 1 of the pilot project, the explanation of the guidelines was wordy. Farmers did not fully understand the cultivation methods, and this resulted in poor practices. Only 20% of the farmers watched a video of the guidelines.

In Season 2, the guidelines were modified, using figures and photographs. In addition, the video was promoted in regular farmers' meetings.

To increase farmers' understanding of the guidelines, field supervisors conducted training for groups of 30 to 50 farmers in each of the project areas before the sowing season. Afterwards, the field supervisors regularly visited the farmers and their fields, and monitored their practices. As a result, the volume of mung beans that grew in size to more than 3.5 mm increased by 5 percentage points to 58.1% from 53. This means the project's target figures were almost achieved. In this way, agricultural skills of BOP farmers were improved.

Meet quality requirements of the international market

Aside from the size of the beans, there are other quality requirements to produce mung beans for sprouts, such as pesticide, fungus, and contamination rate. euglena researches and understands these requirements. It conducts an iterative verification process at its factory and laboratory in Japan to determine the proper cultivation area and sowing time in Bangladesh. This is one of the most important factors in continuing the project, because it is no use letting farmers cultivate something that cannot be sold in the international market. In this way, Grameen Euglena is able to continue buying mung beans at a higher price from BOP farmers and contribute to improving their income.

Resources

Japan International Cooperation Agency (JICA). 2012. *First Shipment of Mung Beans to Japan Cultivated by the BoP Segment in Bangladesh for Consumption as Bean Sprouts*. News release. 14 December.

JICA. *Overview of the project*. In Japanese.

JICA. *Completion report of the project*. In Japanese.



Japan International Cooperation Agency (JICA)

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