

Bhu Amrit Farmer Producer Organization

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This past week, our group visited the Bhu Amrit Farmer Producer Company to speak with farmers and explore the issues they have been facing in Uttarakhand, India. With help from Ph.D. scholar Hiranmaya Barik of the I.I.T. Roorkee Department of Design, we met with the CEO of Bhu Amrit to learn how Farmer Producer Organizations (FPO) under the National Agriculture Bank for Agricultural and Rural Development (NABARD) are helping farmers increase their income by saving money and connecting them to markets. By purchasing raw agricultural materials from farmers, and processing and packing those materials before selling them to markets, Bhu Amrit is helping to retain profits for farmers that would otherwise be lost due to a lack of onsite processing power on the many small marginal farms that populate the surrounding area of Bhagwanpur. As part of this relationship, farmers to avoid the hassle of going to the market themselves as the Bhu Amrit staff bring the products to the markets directly. At the same time, Bhu Amrit helps farmers in buying low-cost agriculture resources such as seeds, fertilizers, and pesticides, as well as renting out large farming equipment like tractors, making sure farmers can access the resources they need with a reduced financial burden. Bhu Amrit also offers training in organic farming practices to farmers who wish to move their production to be healthier and environmentally sustainable. Together with help from NABARD, Bhu Amrit is alleviating issues faced by farmers through a market centered approach. Currently, Bhu Amrit is seeking to expand its marketing network to branch into exporting locally sourced goods to other countries and continue to promote sustainable farming practices to its members.



Figure 1: Our group outside the Bhu Amrit office with the FPO directors.

We are thankful to Bhu Amrit as they were very kind and helpful during our fieldwork, connecting us with an array of different farmers and directing us throughout our visits.

Farming Types

Sugarcane

The sugar cane industry is very large in India, and one of the most labour intensive. Sugar cane is in high demand, as it's processed into varying products such as sugar and jaggery. During the field visit, our group had the chance to visit two jaggery plants, one that was highly mechanized and one that was traditional and manual. At the traditional site we were able to identify issues of sanitation, and issues of safety. One worker was moving boiling sugar cane juice between containers with no safety protection and even open-toed shoes, with old burn marks evident. After the boiled liquid had cooled 4 workers rolled the jaggery manually, squatting on the floor, a position that could cause serious strain in the long-term. Visiting the two jaggery production units highlighted the issues that informal small-scale farmers face here in Uttarakhand, about their safety and well-being.



Figure 2: Traditional method of sugar cane processing into jaggery.

Dairy

Our group visited a local dairy farm. The farm had a total of 25 cows and 25 bulls. The farm did not have sufficient land for these animals and therefore could not have them free range. Instead, the cows were housed in a small shelter beside the farmer's home. We learned how these conditions have negatively impacted the milk production. This particular farm also purchased and stored milk from other small farmers, which they then sold to the market. This was an example of how small farmers work together to support their farms.



Figure 3: Cows at a local dairy farm.

Mushroom

Our group also visited a mushroom farm, where the workers cultivate mushrooms in air-conditioned chambers using compost they make. This includes a couple of stages including a compost made mostly from paddy wheat, and then eventually coco pit compost which is considered more productive. The farmers then meticulously control the temperature in the chamber, decreasing it by one-degree Celsius a day until it reaches 18 degrees. They employ up to 11 women and maintain a farm that appears to be under very good conditions, both for their mushroom output and the workers. One issue they highlighted was that the flies present would often lay eggs that could impact mycelium growth but excluding that the farm had no major issues. This highlights how access to better resources and technology can help reduce the stress small-scale farmers are facing. But receiving access to these technologies remains a hurdle for many local farmers.



Figure 4: Mushroom cultivation.

Solar Drying

We also visited a solar farm, that dried various things such as ginger and turmeric. We got to see the ginger drying process. This process starts with workers unloading bags of ginger from the storage truck, each weighing 40-50 lbs. After this the first step was washing the

ginger. This was done by hand in large basins of water where workers scrubbed the ginger and scooped out the remaining dirt. After the ginger had been properly cleaned it was then sliced by a machine. The sliced pieces of ginger were then laid out in the sun on black tarps or in green houses. This farm employed 12 men and 2 women and operates all year round. We got the chance to interview the workers which inspired the group on potential ways this process could be improved, such as the washing step as they expressed this was the most difficult.



Figure 5: Washed ginger before being sliced.

Horticulture

Many of the farms we visited were involved with horticulture, with a large emphasis on mango, lychee, and guava. In terms of labour, these crops required significantly less upkeep in comparison to other common crops such as sugar cane or ginger. However, one issue identified was the gap between when the trees are first planted and when the farmers can harvest the fruit. It could take anywhere from 1 to even 10 years in the case of mango trees, to produce fruit. This lag in fruit production has the potential to create serious financial strain for these small-scale farmers. The impacts of climate change were also noted by farmers in horticulture, with the unseasonably hot Marches in the last 5 years seriously reducing lychee fruit productivity and yield, and increased incidence of disease and fungus.



Figure 6: Dragon fruit farm.



Figure 7: Hydroponic farm.

Common Issues

As part of our field work, the group took the time to discuss and reflect on our experiences. Together, we identified patterns and common issues we observed over the past week, as seen below.

1. **Labour issues:** Many traditional farming practices are labour intensive. Laborers in the agricultural industry are prone to injury and health issues as the nature of their work involves awkward postures and repetitive movements. Sugarcane farming and production, in particular, has suffered a lack of workers because of the high physical demand, resulting in wage increases.
2. **Land Fragmentation:** Previously, British policies led to displacement and migration in India, forcing people to leave urban areas and settle in rural villages with limited land already. This land has been further fragmented between families and children. The main issue that arises from smaller land plots is the lack of production and profit. Small farmers are forced to have their product sold by a middleman, furthering the lack in profits.
3. **Organic Farming Challenges:** Organic pesticides must be applied more frequently and act only as a preventative measure, they will not be effective once pests have been discovered. Organic fertilizer results in lower growth rate of crops. Additionally, it requires more labor due to increased weeding and spraying of biopesticides. There exists a higher demand in the market for organic products, but that does not always cover increased costs from associated risks.
4. **Pesticide Use:** Increasing temperatures in the last 5 years has led to increased fungus and disease in the soil, leading to further use of pesticides and fertilizers. Lack of education results in overuse of inorganic pesticides and fertilizers. This has resulted in poor soil health, increased fungus growth, and a drop in crop production. Moreover, laborers are not provided with affordable protective equipment for pesticide use and safety measures are not seen as a priority in this sector. The spraying of pesticides without proper protective measures has led to severe health complications for many workers.
5. **Produce Storage:** Overproduction in certain years leads to high saturation in market, exceeding market demand which leads to high post-yield losses. Better storage and refrigeration is needed to keep products for longer to ensure less immediate saturation of the market. Additionally, there is a lack of infrastructure supporting organic storage of products. Pesticides must often be used during this production stage, meaning the product is no longer considered organic.



Figure 8: The group interacting with a local farmer during field visit.



Figure 9: The group touring a local sugar cane farm.