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FEASIBILITY STUDY OF COMMERCIAL FARMING IN DEWATHANG

Purna Bahadur Darjee¹, Tandin Phurba², Punam Mongar³, Kencho Wangmo⁴, Parashuram Sharma⁵

Department of Humanities and Management, Jigme Namgyel Engineering College, Dewathang ^{1,2}

05200312.jnec@rub.edu.bt¹, 05300321.jnec@rub.edu.bt², 05200311.jnec@rub.edu.bt³, 05200300.jnec@rub.edu.bt⁴

parashuramsharma.jnec@rub.edu.bt⁵

Abstract — *The aim of the study was to determine the feasibility of commercial farming in Dewathang with the objectives to examine and analyze the market availability for agriculture products specially fruits and vegetables in Dewathang, to examine the support rendered by agriculture sectors for farming initiatives, to identify the challenges faced by the farmers of Dewathang and examine the feasibility of commercial farming. The study was conducted in Dewathang area by means of a structured questionnaire survey for each respondent type (farmers, shopkeepers, consumers and a program Director of Samdrup Jongkhar initiative). A sample of 51 respondents was drawn from the research area. The approach used in this research paper is Problem-Based Learning (PBL) and data were collected through questionnaires and interviews, it analyses the data collected by Microsoft Excel. The results from the study highlights that the farmers of Dewathang have enough market availability and consumers, renders support by dzongkhag and agriculture sector but owing to the challenges faced by the entrepreneur farming their commercial farming is severely limited. However, seeing that the challenges faced are manageable and have solution, this study shows that there is feasibility for commercial farming in Dewathang. The government has a crucial role to play and has been supporting farmers, but the study recommends that the government provides planned workshops to all the farmers in order to equip them with marketing knowledge, improve their production and gain skills and knowledge on farming. In additional, some other initiatives which promotes in rise of entrepreneur farming.*

Keywords—*feasibility, commercial farming, Dewathang*

I. INTRODUCTION

The importance of commercial agriculture lies in its potential to contribute to economic development, food security, and export earnings in developing countries. In Bhutan, agriculture is still the living culture and landscape heritage, besides having the potential to generate direct revenue from semi-commercial and commercial operations of agriculture activities. Bhutanese generally practice subsistence farming, with agriculture employing approximately 57.20% of the Bhutanese population. Bhutan's economy is mainly comprised of 79% of its population engaged in agriculture and livestock farming. Agriculture plays an important part as it acts as the source of employment and part of daily life for the people of Bhutan. Furthermore, until the 1960s, Bhutan maintained a close relationship with the outside world, and its economy was largely self-sufficient based solely on agricultural production. "Tobgay, 2006 [9]"

The Ministry of Agriculture has the national mandate to increase food production to ensure household food security, alleviate poverty, substitute or reduce imports through increased domestic production, generate marketable surplus, and enhance household income and employment opportunities. The agriculture sector strives to make farming attractive to youth and reduce rural-urban migration. These objectives need to be accomplished while ensuring sustainable conservation of the natural resource base. "Mahesh et al., 2018 [3]."

1.1 Problem Statement

During the initial phases of development in Bhutan, the agriculture sector received high priority, followed by the road sector (Gross National Happiness Commission [GNHC], 2018 [5]).



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Agriculture received 10% of the budget allocation in the economic and public sectors during the fiscal years 2013-2014 (Ministry of Finance [MOF], 2014 [5]). Similarly, in which the agriculture sector received 10% of the budget allocation in economic and public service (Ministry of Finance [MOF], 2016 [5]). So, after going through different budget reports, it can be noted that the agriculture sector has received the highest priority compared to other components of the economic and public sector, such as the road sector, communication sector, and energy. Regardless of such support, it can be seen that Dewathang lacks the ability to do commercial farming other than subsistence farming. In the study conducted by the Royal Government of Bhutan considering the zero landless household report in Dewathang, there is always a possibility of doing commercial farming. Farmers in Dewathang have access to non-farming customers such as Jigme Namgyel Engineering College, Dungsom Academy, Royal Bhutan Army complex, and people living near Dewathang hospital. However, despite having zero landless households and having access to customers, farmers opting for commercial farming to meet their demand is significantly low in Dewathang. So, the question here is why the farmers of Dewathang not opting for commercial farming, especially on vegetables and fruits, when they have potential customers? Thus, this research project is to study the feasibility of commercial farming in Dewathang with all the challenging factors faced by them on the production of fruits and vegetables, based on the aim and objectives mentioned in this research.

II. METHODOLOGY

The study used a Problem-Based Learning approach to identify the current problems that Dewathang residents are experiencing with regard to meet the demand of customer. The data was acquired from the specified sample using a standard survey questionnaire and interviews. An appropriate questionnaire was created for the survey, and respondents were led through it to guarantee accuracy in data collection through interviews. It also gathered information from previous studies of a similar nature. The study's target population includes all Dewathang gewog but is divided into the following groups: 20 available farmers; 15 retailers; and 15 customers at Dewathang; and 1 program director of Samdrup Jongkhar Initiatives. A total of 51 interviews were carried out. The data was then analyzed using MS

Excel to see the feasibility of commercial farming in Dewathang.

III. ANALYSIS OF FARMING MARKET

Upon surveying, the group found out that there are potential customers like Jigme Namgyel Engineering College, Royal Bhutan Army Complex, Dungsom Academy, and Chokyi Gyatso Institute, which normally do not do farming and provides opportunity for marketing local products. 95% of the respondents agreed that they are ready to purchase locally available vegetables and fruits from farmers if they are made available. Whereas 5% of the respondents were not sure whether to purchase from framers due to the high price charged by farmers.

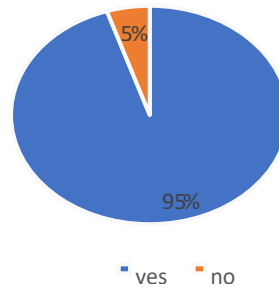


Figure 1: Market Analysis

IV. SUPPORT TOWARDS FARMING BUSINESS

The provision of support services remains one of the major important interventions in the agricultural sector for rural development, commercialization, food security, poverty alleviation, and income generation of emerging farmers. Commercialization of farmers cannot be achieved without appropriate agricultural support services. With adequate access to farmer support services, emerging agriculture can contribute to increased agricultural growth, rural development and have a positive impact on their farm income.

In this study, farmers were asked with what kind of support and services they were offered to understand the support rendered by the agricultural sector. The majority of the sampled farmers claimed to be receiving support services for their farming enterprises, while 36% claimed that they did not receive any support services but had to rely on their own resources.

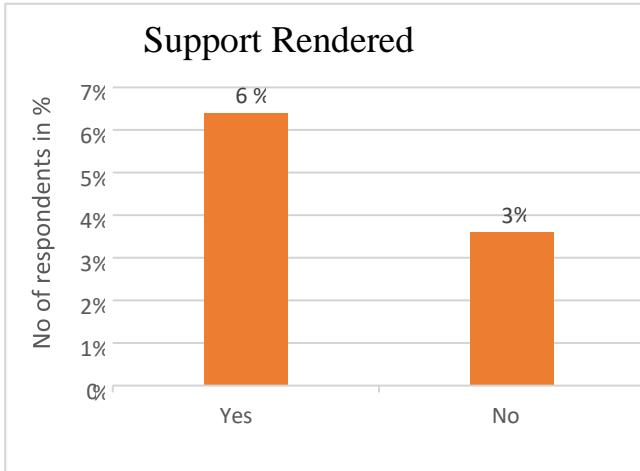


Figure 2: Support rendered by Government.

In line with the support received by farmers, the study has seen some of the various areas where the government has provided support to farmers in Dewathang. The respondent has seen support in providing seeds, financial support such as farming loans, machinery support, irrigation support, and training and skills support. Table 2 represents the respondent count on the government's support. (n=32).

Support Rendered	Count	
1. Provide Seeds	Yes	32
	No	0
2. Financial Support	Yes	26
	No	6
3. Irrigation Channels	Yes	20
	No	12
4. Training and skills	Yes	17
	No	15

Table 1: Support services

Furthermore, in this project work, to find out the benefits that are gained by farmers after receiving the above support rendered by the agriculture sector of Dewathang. So, upon surveying, the following are some of the benefits:

- 32 respondents stated that despite having low soil fertility, they harvested varieties of vegetables such as brinjal, cauliflower, broccoli, and fruits such as guava, jackfruits, and litchi due to the government providing them with seeds and saplings.
- Out of the 32 respondents, 26 of the respondents stated that although they face financial issues to undertake the farming, due to the dzongkhag and agriculture sector rendering them even the financial support has been of great help to promote their farming.
- Of 32 respondents, 20 of them stated that they were able to get enough water compared to the past five years due to the installment of irrigation channels and due to upcoming water projects in Samdrup Jongkhar.
- Those who agreed upon the government providing training had stated that they have undergone agriculture training. Thus, they were able to improve their farming style and they were able to get familiar with modern agriculture technologies.

V. CHALLENGES FACED BY ENTREPRENEUR FARMERS OF DEWATHANG

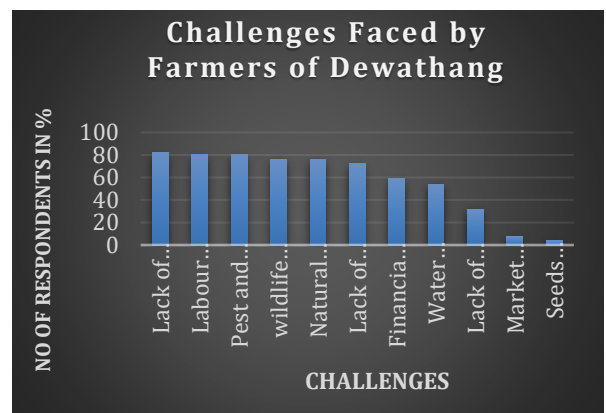


Figure 3: Challenges faced by famers

Entrepreneur farmers of Dewathang are not able to do commercial farming despite having access to market places like Jigme Namgyel Engineering College, Chokyi Gyatso Institute, Royal Bhutan



Army Complex, and Dungsum Academy, which normally do not do agriculture. So, the overlying objective of this research is to find out the challenges that limit the entrepreneur farmers of Dewathang to commercial farming from subsistence farming. Thus, the challenges are pointed out through the survey and by categorizing them into three parts, namely, major challenges, neutral challenges, and minor challenges. The challenges analysis is made up of 51 respondents, inclusive of farmers, customers, shopkeepers, and Mr. Cheku Dorji, the Program Director of Samdrup Jongkhar Initiatives.

According to this research, despite the major challenges discussed in the preceding chapter, this research has found that Dewathang is viable for commercial farming. In the 1980s, Samdrup Jongkhar was practically self-sufficient in food production, with almost nothing bought or imported from across the border, according to Bhutan's Auditor General, who is originally from Dewathang (Samdrup Jongkhar Initiatives [SJI], 2015 [10]. The following are some of the major reasons for the feasibility of commercial farming in Dewathang:

VI. FEASIBILITY OF COMMERCIAL FARMING

5.1 Major challenges

Sl.no	Challenges.	Yes (in %)	No (in %)
1	Lack of soil fertility	82%	18%
2	Labour shortage	80%	20%
3	Pest and Diseases attack	80%	20%
4	Wildlife conflict	76%	24%
5	Natural calamities	76%	24%
6	Lack of technology	72%	28%

Table 2: Major challenges

5.2 Level of Education.

One of the common and major challenges, according to the respondents, also is the level of education where it shows that the education levels of the farmers are low as 70% of the farmers had less than a grade 8 school level; 17% were in grades 9–10; and 13% had a secondary education level (grades 11–12), which shows that 87 % of the farmers had less than a grade 10 school level. Moreover, none of the heads of households had tertiary education. Thus, this figure indicates that due to the lack of knowledge and education, it is difficult to adopt and understand technology and other operational management issues affecting farming. Education is an important factor in being able to do better work and have better production in farming.

6.1 Geographical Features

Dewathang covers 174.883 square kilometers, with 144.32 acres of wetland and 3463.78 acres of dryland. 85 percent of the land is covered by a broad-leaf subtropical evergreen forest. With an elevation of 870 meters, it is higher than the other gewogs in Samdrup Jongkhar (2855 feet). The soil types range from sandy to clay loam, with the latter being suitable for agricultural use. This data clearly demonstrates that there is more dryland than wetland, which is sufficient for vegetable and fruit cultivation.

6.2 Weather Conditions

Samdrup Jongkhar is located in Bhutan's Wet Subtropical Zone, which has the country's lowest altitude, warmest weather, and most rainfall (5,309.4 mm; 19 as recorded at Aerong), as well as an average annual humidity of 7%. The monsoon season lasts from June to September, while the dry season lasts from October to March. The dzongkhag's diverse agroecological zones provide a variety of opportunities for vegetable and cash crop cultivation due to the warm climate.

The most widely cultivated vegetables continue to be potato, Spanish, radish, chili, pumpkin, and onion, though brassicas such as cabbage, cauliflower, and broccoli, as well as solanaceous crops such as tomato and eggplant are increasing in popularity as they enter the palettes of the population.

6.3 Taste and Preferences of Consumer



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93% of respondents prefer organic local products over imported products. As a result, it demonstrates that there is sufficient demand in Dewathang to motivate entrepreneur farmers to engage in farming. Because of the low cost, 7% of the respondents said they would choose imported goods. However, most consumers are concerned about their health and prefer organic products, and if more entrepreneur farmers supply the market, prices will fall as a result of increased supply to meet consumer demand. Furthermore, Dewathang entrepreneur farmers have access to potential customers such as Jigme Namgyel Engineering College, Dungsum Academy, Royal Bhutan Army complex, and people living near Dewathang hospital.

6.4 Demand in the Market

According to the consumers, they are willing to buy vegetables and fruits that are produced locally rather than imported ones. Nevertheless, they stated that because of low supply from the farmers of Dewathang, they were left with no option other than to buy the imported vegetables and fruits. In addition, retailers in Dewathang who deal with vegetables and fruits are also willing to buy from farmers in Dewathang rather than import from other dzongkhag such as Trashigang, Phunthsoling, and India, where they also complained about high transportation costs. Thus, there is more demand for local goods compared to imported ones, which promotes efficiency for the shopkeeper.

6.5 Support from the Government and Agriculture Sector

According to 64% of respondents, the government and dzongkhag provide assistance in the form of seeds, financial assistance such as farming loans, machinery assistance, irrigation assistance, and training and skills assistance. This assistance acts as a major motivator for entrepreneur farmers to continue farming and increases the viability of commercial farming.

VII. FINDINGS AND SOLUTIONS

Farmers in Dewathang have access to customers who do not farm, such as Jigme Namgyel

Engineering College, Dungsum Academy, Royal Bhutan Army complex, and people living near Dewathang hospital, indicating that there is market availability for entrepreneur farmers. Despite the fact that 64% of respondents agree that the government and agriculture sector support farmers in their farming endeavors, the farmers of Dewathang are unable to produce enough food for the local population due to major challenges they face. The above-mentioned challenges, on the other hand, are manageable and have a solution that contributes to commercial viability:

1. A lack of soil fertility has become a major challenge for farmers, leading to low-scale production. To maintain soil fertility, farmers can use a variety of techniques, including rotating crops, mulching, composting, incorporating green manure, tethering cattle in their fields, and intercropping.
2. In Dewathang, the challenge of labor shortages and high wage rates can be overcome by forming cooperative marketing groups to help alleviate labor shortages and facilitate resource sharing. Furthermore, the use of advanced technologies and mechanized farming can make work easier and encourage younger generations to pursue careers in agriculture.
3. Diseases and insects Attacks are just a few of the major factors that farmers must contend with. Intercropping, crop rotation, mulching, composting, use of green house and other traditional methods can be used to control it.
4. Farmers in Bhutan are particularly concerned about the human-wildlife conflict. Wildlife interference in farming is thought to be the result of several factors, including diminishing habitat in neighboring Assam, as well as Bhutan's abundance of wildlife corridors and protected areas. Hedgerows, thorny bushes and fence, trees, and other natural barriers that can be planted around the



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perimeter of crops to deter certain animals can be used to control them.

5. Natural disasters, such as heavy rain and strong winds, were also identified as one of the study's major challenges for Dewathang farmers. Although natural disasters are unavoidable, farmers can be prepared and reduce the impact on vegetables and fruits by diversifying their crops, using proper irrigation channels, and harvesting rainwater.
6. Providing an awareness program and training can assist farmers who have been identified as illiterate and are having difficulty understanding how to use modern technologies.

To summarize the findings, it can be seen that Dewathang is capable of commercial farming, despite the numerous challenges faced by Dewathang farmers, which have limited their ability to produce on a large scale in order to engage in commercial farming. The challenges, on the other hand, appear to be manageable and have solutions that will benefit commercial farming.

VIII. RECOMMENDATIONS AND CONCLUSION

8.1. Recommendation

- i. The main reason why farmers are unable to engage in commercial farming is a lack of soil fertility. As a result, to improve soil fertility, the group recommends using a terrace system to prevent topsoil loss and using organic manure rather than chemical-based fertilizers, which lower crop quality.
- ii. Farmers identified a lack of labor, a lack of access to tools and technology, and water shortages as their top farming challenges. The Appropriate Technology sector has the opportunity to collaborate closely with farmers to develop labor-saving devices and tools. Farmers should be consulted about the

SJI's rainwater harvesting project to see how feasible it is to implement on their own farms. The formation of cooperative marketing groups could aid in the alleviation of labor shortages and the sharing of resources. A government or SJI-led program in which students work in groups on farms during their long winter break during the dry season, helping with needed infrastructure work such as terracing, irrigation, repairs, and so on, in exchange for compensation. This could be related to current events.

- iii. The SJI could promote a variety of organic methods to protect crops and farmers. To deter certain animals, hedgerows, thorny bushes and fence, trees, and other natural barriers could be planted around the perimeter of crops. This has the additional benefit of preventing erosion. Trenches could also be dug, but they come with their own set of problems, such as requiring already overworked and scarce labor.
- iv. Food loss due to storage was a major topic of conversation during the interviews. Some farmers lost 50–100% of their crops in storage. To reduce food spoilage, appropriate drying and preserving options should be investigated, and farmers should be offered subsidized electric driers by the government.
- v. The training should be followed up on by the SJI in order to mandate agriculture training and monitoring in the area, thereby increasing awareness in the agriculture sector and increasing productivity through learning and experience.

8.2 Conclusion

Agriculture has seen as one of the national mandates to increase food production, in which about 79 percent of Bhutanese population is engaged in agriculture. Furthermore, according to article “Agriculture Diversification in Bhutan”, Bhutan despite remaining closed to outside world during 1960s, Bhutan was able to be self-sufficient mainly due to agriculture. However, article also states that rural-urban migration has become real



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concern for government and due to which production from agriculture was decreased. Samdrup Jongkhar Thromde, despite receiving capital subsidies of not less than Nu.100 million every financial year it has been found out that farmers of Dewathang Gewog are lacking to do commercial farming. Thus, underlying the objective of this study and to find out the feasibility of commercial farming in Dewathang, group have done survey which includes total of 51 respondents. Moreover, the methodology used for data collection was questionnaires, interview and sample size.

The finding of this research showed that despite having enough market availability, the farmers of Dewathang are unable to do commercial farming. Furthermore, the research also showed that the main factor or challenges that limit farmers of Dewathang to do commercial farming are mainly due to labor shortage, lack of soil fertility and lack of technology. Moreover, natural calamities, pest and diseases attack, and human-wildlife conflict are commonly faced challenges which limits farmers of Dewathang to have high production which eventually restricts farmers from proceeding to commercial farming from subsistence farming.

Finally, the study discovered that Dewathang farmers have the opportunity to engage in commercial farming, with 42 out of 51 respondents stating that there is sufficient market availability to market their products. Despite the difficulties encountered during this research project, the group came to the conclusion that Dewathang is feasible for commercial farming because of the various factors that contribute to this.

ACKNOWLEDGEMENTS

The group would like to express its heartfelt gratitude to the Royal University of Bhutan for having such a project-based curriculum that aids in the practical application of theoretically learned skills and knowledge. The group also would like to express gratitude to Mr. Parashuram Sharma, the project mentor, to Mr. Kul Prasad Sharma (Head of Department of Humanities and Management) and Mr. Namgay Dorji (Project Coordinator). The group also would like to thank Mr. Cheku Dorji, the Program Director of Samdrup Jongkhar Initiatives for all their kind support and continues mentor in course of completion of this study. Similarly, the

group is hugely indebted to all the respondents for finding the time to answer the survey questionnaires with their honest and cooperative responses to all the questions solicited in this study.

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