



Research Article

Banana Production Status and Its Role on Income Generation and Livelihood Improvement in Chitwan, Nepal

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Abstract

The demand of banana fruit is ever increasing and Nepal's Terai region has immense potential for this high value crop. Government has kept it at top most priority where it can be grown like Chitwan district. This study examined the banana production, problems of banana production and about the livelihood improvement of banana farmers in Chitwan district, Province No.3 of Nepal during the year of 2022. Tharu were the dominant ethnic group of these villages. The numbers of respondents selected for this study belong between 22-59 years old. The major occupation of these respondents was farming 91.4 percent and 8 percent were in other services. A survey was conducted from a representative sample size of 60 banana growers. The sample was selected by using simple random sampling technique. Banana producers of Chitwan district are taking good benefit from the banana fruit as income was higher than the cost. It was found that from 1 bigha farmers can have income of Rs 650000 with the cost of Rs 345000. It was found that among different sources of credit, people were mostly reliant on their own fund. People's participation in various social groups such as savings and credit group, farmers group, water user group, cooperatives and other social groups have increased over the time. To enhance more banana production quantity and quality major problems of farmers should be dealt with, which would help to increase their earning resulting in higher living standard day by day and that way we can encourage more production.

Keywords: Banana; production; livelihood; Income

Introduction

Nepal is an agricultural country and has been the major economic source of the majority of the families in our country is agriculture. Greater than 70% of our workforce is concerned in agriculture and this area gives about 40% of total home production. It provided more than 66 percent of employment opportunities and provided about 33 percent nationally (MoAD, 2014). Bananas (*Musa paradisiaca* L.) of the Muscaceae family are a tropical fruit that grows well in clusters. It is long and curved in stature. Chitwan is the largest producer of bananas after Saptari, Jhapa, Morang

and Rupandehi regions. In Nepal, bananas have long been cultivated in the backyard for the home consumption purpose (Gautam & Dhakal, 1994). Various indigenous knowledge are still in practice for cultivating and storing seeds of banana (Adhikari et al., 2021). According to Nepal agriculture statistics the total area covered by banana in the Years 2012/2013 was found to be 11.864 ha with a gross production at about 1,82,005 tones (ICIMOD, 2015). The total area covered by banana in Chitwan according to agricultural status in the Years. To extend the shelf-life,

reduce spoilage and deterioration, fruits should be kept at 0°C after harvest. This cold storage should be built near the market. Even the market should be established near the production area to reduce the loss that occurs during transportation (Chaulagain et al., 2022). According to the Department of Agriculture, the current average production rate is 13.2 tons per hectare. It is presently grown in 68 districts, and the production region for banana plantations in 2012/2013 was 11,864 hectares, with a total production of 182,005 tons. Despite the fact that there may be extraordinary ability for banana production in Nepal, there are few commercial banana markets and present-day production is low (Bhat et al., 2011). In step with the Department of Agriculture, the contemporary production rate is tons per hectare, with a maximum yield of 20 tons per hectare. Demand for bananas in Nepal presently exceeds the entire national production (DADO, 2019). According to the Trade and Export Promotion Center of the Government of Nepal in 2011/2012, Nepal imported 27,878 tons of bananas to India to meet domestic demand, particularly in city and peri-urban areas. Commercial banana cultivation has begun in some of the inland Terai, river valleys, and hills (Guledgudda et al., 2002). The three open borders on the Indian border and the open border between China are a major challenge and opportunity for the agricultural sector in Nepal (Gangal, 2002).

Because of the growing population, increased tourist inflows, and more understanding about the nutritional benefits of bananas, Nepal's domestic demand for bananas has been increasing year after year. However, due to intermittent demand and a lack of coordination between production and marketing, the predicted pace of expansion in terms of area and output has yet to be achieved. Indian bananas currently account for around 58 percent of the global banana market. As a result, finding a market for commercial banana production in Nepal may not be an issue. The remaining restrictions for banana growing are a lack of inputs, disease-free seedlings, agricultural loans, efficient post-harvest management, price fluctuation, and low bargaining strength (Dulal & Kattel, 2020).

Various research institutes under the NARC have produced improved varieties of bananas. And technology is being disseminated to farmers as fully as new in the Department of Agriculture (Gowda, 2002). Lack of inputs, disease-free shoots, agricultural debt, post-harvest proper management, price differences, inability to negotiate are the remaining challenges in growing bananas. (Dulal & Kattel, 2020). The government has formulated several policies and programs for the commercialization of agricultural sector. But most of them seem to have been limited only to policy and not be able to show real impact on the farmer's level. So, most of the farmers have been adopting less profitable, traditional production practices which are characterized by high cost of production, low productivity and low profitability. Banana

has an important contribution to the country so that some efforts have been made by both research and extension systems for its promotion. In this Context, this paper examined the banana production, problems of banana production and about the livelihood improvement of banana farmers in Chitwan district, Province No.3 of Nepal.

Materials and Methods

Study Area and Sampling Design

The research was conducted in Chitwan district, which is one of the most potential pocket area for banana production both in terms of area and production and where most of the farmers have been engaged in banana production and cultivation practices. Under the One Village One Product (OVOP) program of the Nepalese government, the region was given the first place in banana production. A total of 60 banana-producing households were selected on the basis of random sampling to assess the state of banana production and their role in income generation and improving the quality of life in Chitwan, Nepal.

Data Collection and Analysis

Field survey was conducted through structured and semi structured questionnaire, focus group discussion, direct observation and key informant interview. The second information was collected in various published books such as journals, research articles, by various NGOs and NGOs, reports from the Agriculture Knowledge Center, Banana officials. Data collected were analyzed using SPSS and MS Excel software.

Benefit Cost Analysis

It was calculated by using following formula:

$$B/C \text{ Ratio} = \frac{\text{Gross Return}}{\text{Total Variable Cost}}$$

Problems Ranking

A special ranking level of production problems and diseases is made by identification. Data scores were performed to assess the level of knowledge of farmers according to the results of the questionnaire. Indexing was computed using following formula.

$$I_{\text{imp}} = \sum (s_i \times f_i / N)$$

Where, I_{imp} = Index of importance

\sum = Summation

s_i = Scale value

f_i = Frequency of importance given by respondent

N = Total number of respondents

Results and Discussion

Status of Banana Production

Fruit is a major contribution on economy and nutritional health of Nepalese farmers. Tropical fruit such as banana,

papaya, mango, guava, and litchi were major fruit grown at study area. (Fig 1). According to residents and agricultural stakeholders, banana income has been a major and reliable source of income for farmers in the Chitwan region of Nepal. This survey study revealed that income from banana production contributes a major part of total income from fruit in Chitwan district, Nepal. Income from banana had highest contribution (40%) on total income from other fruits (Fig. 1).

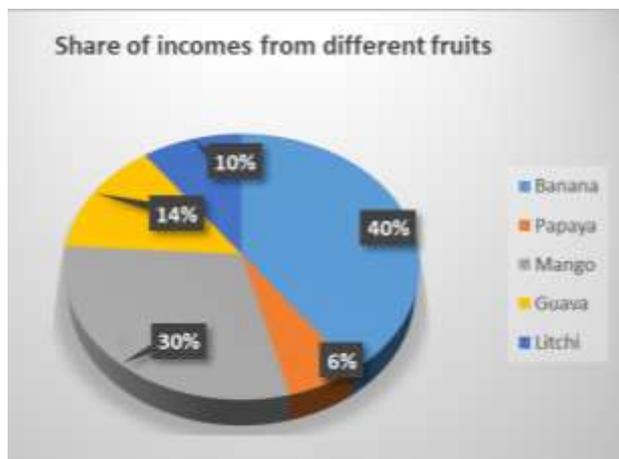


Fig. 1: Share of banana on total income from fruits.

In the study area, Banana cultivation is the integral behavior from the very beginning. Farmers are growing the Banana in every land they possess. Other crops such as Rice Vegetable cereals are also done in the form of alley cropping. The banana production requires different yet appropriate techniques to make it as a successful entrepreneurship.

Respondent farmer in the study has been involved in different varieties such as Malbhog, William hybrid, Giant-9(G9) and Red banana from Tamil Nadu. The Malbhog was majority of the cultivation in the study area 88%. The William was 7%, The G9 was 4% and Red banana was 1%

cultivated in study area. They also said that Malbhog was the best varieties that suited on the climatic condition of the study area and productivity was also high (Fig. 2).

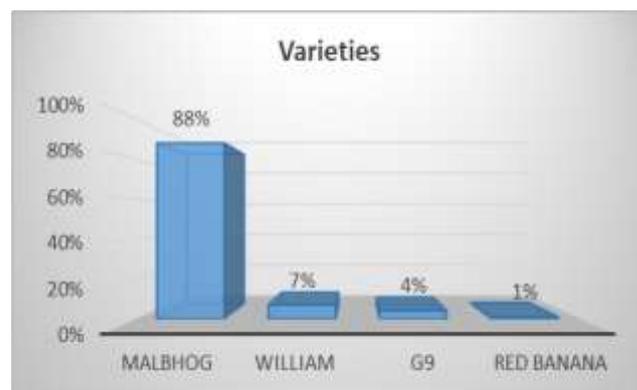


Fig. 2: Varieties of banana used by respondents

Problems of Banana Production

Disease was the major problem in cabbage production in the study area with highest index value of 5.34. Marketing was the second important problem with index value 4.9 followed by Insect with index value 4.46, Climate with index value 2.5 and Input unavailability with index value 1.76. Data shown in the Table 1 describes the ranking of problem in banana production in Chitwan, 2022.

In the study area diseases such as *Fusarium oxysporium* (oiluane rog), *Boitryodiplodia* (gubho kuhini rog), bunchy top virus and *Anthraco* (kotre rog) were prevalent (Fig. 3a&b). Among them *Boitryodiplodia* was the severe one followed *Fusarium oxysporium*, bunchy top virus and anthracnose on the basis of respondents' response moreover, insects such as banana steam weevil, rhizome weevil, Banana beetle, aphid, mealy bug and scarring beetle scale were prevalent. Among them banana stem weevil was the major insects causing problem followed by, rhizome weevil, aphid, mealy bug scale and scarring beetle responding as their major insects.



Fig 3. (a) Buncy top virus; (b) Damage done by scarring beetle (Photo credit: Bipul Poudel, Himalayan College of Agricultural Sciences and Technology, Kirtipur, Kathmandu, Nepal)

Table 1: Ranking of problem in banana production in Chitwan, 2022

Problems	Level						Weight	Index	Rank
	6	5	4	3	2	1			
Disease	40	6	8	6	0	0	320	5.34	I
Insect	0	31	26	3	0	0	268	4.46	III
Climate	0	3	9	16	18	14	149	2.5	IV
Inputs	0	0	0	15	16	29	106	1.76	V
Marketing	18	24	13	5	0	0	295	4.9	II

Source Field Survey, 2022

Income and Cost Statement

Table 2 shows that cost of production refers to the outlay of funds for the procurement of necessary inputs and labour employed. From 1 Bigha farmers can have income of Rs. 650000 with the cost of Rs. 345000 with which every 2.5 rupee spent on banana, it gives 5 rupees in return. So, it's a profitable business. The result came in accordance with the survey and from the banana zone and Shikhar Insurance. The cost of production per bigha of various variables was studied and data is shown in the Table 3.

Table 2: Income and Cost Statement (2018)

Income (Rs.)/Bigha	Cost (Rs.)/Bigha	Bc ratio
650000	345000	1.88

Sources of Income and Trend of Expenses of Banana Farmers

Regular source of income is needed to maintain good livelihood of the family. There are various sources of income. In the present study area result showed that 92.85% of peoples source of income was Banana farming, 7.1% people were earning from Alley cropping, 62.8% people were earning money from business, 10% of people were earning from government job and only 51.4% of people were earning money from foreign employment. And from the livestock 72.28% are earning (Table 4).

In the study area main source of income was Banana farming and people were earning mean of Rs. 307733.3, from alley cropping having mean of Rs. 15000.

Table 3: Variable cost of production per Bigha (2022)

Variables	Average cost (Nepali Rs)
Manure cost/bigha	150000
Intercultural operations cost/bigha	70000
Training and pruning cost/bigha	30000
Plant protection cost/bigha	40000
Labour cost /bigha	800 person/day
Land Lease cost	3700
Land Preparation	25000
Miscellaneous	30000

Source Field Survey, 2022

Table 4: Sources of income

Income sources	Frequency	Percentage
Banana Farming	65	92.85
Alley cropping	5	7.1
Government job	7	10
Business	44	62.8
Foreign employment	36	51.4
Livestock	52	72.28

Source Field Survey, 2022

Trend of household expenses was studied and data is given in Table 6.

Table 6: Trend of household expenses

Expenses	Current			Before 5 Years Rs.			Before 10 Year Rs.		
	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean
Travel and entertainment	5000	150000	34557.1	8000	100000	24985.7	5000	86000	18914.3
Food expenses	25000	180000	58542.9	18000	130000	44557.1	12000	100000	35371.4
Medical expenses	2000	200000	22257.1	3000	60000	13492.9	1000	45000	7800
Social function expenses	18000	150000	50971.4	17000	100000	38185.7	11000	60000	27792.9
Social trust expenses	1000	23000	4581.82	500	15000	3260.87	500	8000	2144.74
Education expenses	12000	200000	84384.6	8000	150000	60644.4	4000	200000	43452.8

Source Field Survey, 2022

Conclusion

Chitwan is a potential district for the production of banana in the country. Banana producers of Chitwan district are taking good benefit from the banana fruit as income was twice higher than the cost. Among various problems, majority reported diseases and insects as the main problem. Regarding the technology adoption all the people were using improved varieties, practicing flower and fruit thinning, Flowering and fruit thinning, Among the fruit cultivated commercially in the study area banana was one of them which is considered high income generation fruit. Majority of the respondents were inspired themselves for banana production due to its high income and also they didn't have other work as well. In addition, the government should also intervene to regulate markets and pricing policy in order to increase the price of farm gates.

Authors' Contribution

A. Adhikari designed the research plan and analyzed the data and edited the manuscript and B. Paudel and A. Pokhrel performed household's level required data collection from field and both authors prepared and finalized the manuscript.

Conflict of Interest

The authors declare that there is no conflict of interest with present publication

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