



RESEARCH PAPER

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Economic analysis production and marketing system of Banana in Lasbella (Coastal area) District in Balochistan

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Abstract

Banana is a nutritious fruit and leads all other fruits in food value. It is rich in carbohydrates, minerals and vitamins. Economic importance of banana over other fruits is that it is perennial and a regular source of income for growers. There is low productivity of banana in Pakistan compared to other developing countries, mainly because of poor management practices and post-harvest losses. Keeping in view the importance of banana this study has been planned to the existing production and marketing system, identify the technical and socioeconomic constraints in production and marketing system; to quantify the market margins of producers and other market intermediaries; and assess ways and means to improve the producer's share and consumer's surplus; to develop policy recommendations for efficient production and marketing system to safeguard the interests of producers as well as consumers and to identify the major constraints in banana cultivation and marketing system in Lasbella District. According to the study results the growers received 4533, 5160, 4638 and 4455kgs yield per acre and sale price was Rs. 35.12, 36.08, 35.6 & 36.5 perkg in Bella, Uthal, Winder and Hub tehsils respectively. The cost of production of banana crop was Rs. 117474, 119132, 99146 and 111650 per acre and gross revenue obtained was Rs. 159199, 186173, 165113 and 162608 per acre in Bella, Uthal, Winder and Hub tehsils respectively whereas, banana grower's received net income was Rs. 41725, 67040, 65966 and 50958per acre in Bella, Uthal, Winder and Hub tehsils respectively.

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Introduction

Banana is the 4th largest crop of the world. It is staple food for more than 70 million people in the Sub-Saharan Africa. (S. C. Sarode, 2009) investigated that Banana is a popular and important commercial fruit crop grown in tropical and sub-tropical part of world. Banana is a major fruit crop of Pakistan, as well as Sindh and Balochistan were main producing provinces in Pakistan. Bananas have been an important cultural food for many different countries, although the genus of bananas, *Musa*, is native to South and Southeast Asia. The full scientific name of bananas is *Musa acuminata*. Now, bananas are grown in more than 100 countries around the world and can also be used to make fiber, banana wine, and even as ornamental decorations. The fruit of the banana tree is eaten directly when ripe or as a part of fruit salads, juice, or shakes. Unripe bananas can cause severe indigestion and should be eaten only in cooked form. Also, bananas are good toppings for breakfast cereals, or as a snack for a quick burst of energy. Bananas are more commonly found in Europe and America, and are soft, desert fruits. Banana is the premier fruit of Asia and the Pacific. It is one of the most cultivated fruits in Indonesia, Thailand, Vietnam, Philippines, Bangladesh, the South Pacific island countries, India and Pakistan. Banana also occupies an important position in the agricultural economy of Australia, Malaysia, Taiwan, Sri Lanka, and Southern China. Bananas trace their roots back to the jungles of Malaysia, Indonesia, the Philippines, and northern Australia. They have been in cultivation since the time of recorded history and are mentioned in ancient Hindu, Chinese, Greek, and Roman texts. The first Europeans to refer to bananas were the armies of Alexander the Great during their conquest of India in 327 B.C (Iqra & Mehboob Ulhaq, 2013).

Banana is a very popular fruit due to its low price and high nutritive value. It is consumed in fresh or cooked form both as ripe and raw fruit. Banana is a rich source of carbohydrate and is rich in vitamins particularly vitamin B. It is also a good source of potassium, phosphorus, calcium and magnesium. The fruit is easy to digest, free from fat and cholesterol. Banana powder is used as the first baby food. It helps

in reducing risk of heart diseases when used regularly and is recommended for patients suffering from high blood pressure, arthritis, ulcer, gastroenteritis and kidney disorders. Processed products, such as chips, banana puree, jam, jelly, juice, wine and halva can be made from the fruit. The tender stem, which bears the inflorescence is extracted by removing the leaf sheaths of the harvested pseudo stem and used as vegetable. Plantains or cooking bananas are rich in starch and have a chemical composition similar to that of potato. Banana fiber is used to make items like bags, pots and wall hangers. Rope and good quality paper can be prepared from banana waste. Banana leaves are used as healthy and hygienic eating plates. The many medicinal benefits of bananas are attributed to its rich vitamin, mineral, and organic compound content. Let's explore the actual content of what makes bananas such an important, powerful, and beneficial fruit. The health benefits of bananas include helping with weight loss, reducing obesity, curing intestinal disorders, relieving constipation, and curing conditions like dysentery, anemia, tuberculosis, arthritis, gout, kidney disorders, urinary disorders, menstrual problems, and burns. They are also good for reducing blood pressure, protecting heart health, modifying the metabolism, improving the immune system, reducing the severity of ulcers, ensuring healthy eyes, building strong bones, and detoxifying the body (PAR, 2015).

Composition of edible portion of the fruit is 74.8 per cent water, 1.2 per cent protein, 0.2 per cent fat, 0.84 per cent ash, 0.6 per cent fiber, 19.2 per cent sugar as invert and 0.39 per cent malic acid. Banana has 445 calories per pound (Manzur *et al*, 2007). Banana is a nutritious fruit and leads all other fruits in food value. It is rich in carbohydrates, minerals and vitamins. Banana produces 300 to 700 mounds of edible matter per acre, higher than average yield of any food crop. Banana has a lot of potential to earn foreign exchange. During the four months of the peak season about 50 to 60 trucks (250 MDS capacity) of banana per day are exported to Afghanistan and about four to five trucks to Iran (Khushk A. M. & Cheema I, 2008). The four leading banana export countries worldwide are Ecuador, Costa Rica, Philippines, and Colombia.

Ecuador provides more than 33% of the global banana export. In 2004, banana producing countries totaled 130. Production, as well as exports and imports of bananas, are nonetheless concentrated in a few equatorial countries. 75% of total banana production in 2004 was generated in 10 countries. India, Ecuador, Brazil and China produced half of total bananas. Latin American and Caribbean countries led banana production up to the 1980s, and Asian nations took the lead in banana production during the 1990s. African production levels have remained mostly unchanged (Conference UN, 2009). Banana sector of Pakistan is facing serious problems from production to post harvest management and export marketing. In view of limited awareness and technical know how about this sector, our basic aim of this guide is to provide technical assistance to growers, post-harvest managers and exporters in order to overcome pre- and post-harvest problems and enhance production and quality of banana for local and foreign markets while ensuring increased profitability for banana growers. It includes the information about banana varieties and their potential, banana disease management particularly banana bunchy top virus, nutrient management in banana, pre-harvest banana bunch care, banana cool chain requirements, and also to establish effective linkages among the key players in banana value chain management including production, post-harvest management and marketing of banana.

Banana crop is grown on commercial scale in Pakistan. It is grown on 30.1 thousand hectares with production of 135.1 thousand tons during 2017-18, but it has been slowly area increased and production decreased due to attack of banana bunchy tops various (GOP, 2017-2018). The efforts have been made at national and regional level to overcome this problem. The area and production of banana in Pakistan is slowly increasing. Whereas in Balochistan, it is grown on 0.9 thousand hectares and production of 2.0 thousand tons in the same year but area it has been same and production has been decreased from last five years due to shortage of water, attack bunchy various, close the Hub dam for agriculture purpose and high electricity loadshedding found in the study

area. Balochistan contributes an area of 3.7 percent, whereas, production is 8.7 percent of the country during (GOP, 2017-2018). It is mainly grown in Lasbella district of Balochistan province where the soil and climatic conditions are favorable for its successful cultivation. In Lasbella District banana is cultivated about 0.92 thousand hectares, approximately produce 7.70 thousand tons of banana and yield per hectare was 17868kgs during 2015-16 (GOB, 2015-16). However, horticulturists have developed technology for the diseases prevention through cultural practices, they use to destroy the disease affected plants and cut the orchard after three years of fruiting. It is reported that after three years the disease attacks the standing plants and plants cannot survive (Mari F.M *et al*, 1999).

There is low productivity of banana in Pakistan compared to other developing countries, mainly because of poor management practices and post-harvest losses. There is lack of government policies for the development of the horticulture sector, including research, development and extension services. Keeping in view the importance of banana this study has been planned to identify the major constraints in banana cultivation and marketing in Lasbella District. The main purpose of this study is to conduct detailed investigation of banana production and marketing systems in Lasbella District. The specific objectives are: to study the existing production and marketing system of Banana in Lasbella District; to identify the technical and socioeconomic constraints in production and marketing system which have an impact on the expansion of its production and marketing; to quantify the market margins of producers and other market intermediaries; and assess ways and means to improve the producer's share and consumer's surplus and to develop policy recommendations for efficient production and marketing system to safeguard the interests of producers as well as consumers.

Materials and Methods

The study was conducted through primary data collection from banana growers who had planted banana crop in district Lasbella, Balochistan province

of Pakistan. A survey methodology used to collect primary data because it is commonly used in the field of social sciences. A wide range of problems can be investigated by using this approach (Gall, Borg, Gall, 1996). Survey methodology provides the plan for the study and overall framework for collected data. Survey design is an effective way to measure responses on fairly easy fashion as it uses well developed questionnaire. The methodology includes data source, study area, data collection and data analysis procedure. Finally, it ends up with the farm cost calculation of banana production

The primary data will be collected through farmer's interview regarding banana crop and to quantifying the level of input and other related issues. Secondary data were collected on different variables like area production and yield of banana crop. Other variables were collected from various sources including, Agriculture Statistics of Pakistan, Agriculture Statistics of Balochistan and Agriculture extension. The study will be undertaken in Lasbella district in Balochistan. The data were gathered from 86 producers of banana crop, randomly selected from 29 villages, 10 wholesalers, 15 retailers and 5 commission agents from the all study tehsils. The farmers were randomly selected by chance meeting with them at the time of survey. For analysis purposes, based on farm operational holding, the sample farmers were classified into small (≤ 12.5 acres), medium (>12.5 to 25 acres) and large (> 25 acres) farmers categories. The gathered information was pertained to banana production during 2017-18. The sample composition across sample districts is given in Table 1.

Table 1. Sample Size by Selected Tehsils.

SL	Tehsils	Producers (#)	Wholesalers(#)	Commission Agents(#)	Retailers(#)
1	Bella	16	2	2	5
2	Uthal	38	4	3	6
3	Winder	18	2	0	2
4	Hab	14	2	0	2
All		86	10	5	15

Source: Survey data, 2017-18

A questionnaire was developed and pretested before conducting the formal survey. The questionnaire covered information relating to the socioeconomic

characteristics of the respondents like land tenure, farm size, source of irrigation and other related variables. It also included questions related to total banana area in 2017-18, total area, input use, production practices and physical productivity. Farmers were interviewed personally at their farms. Before starting the interview, the researchers explained the purpose of the research and assured the respondents that all information would be confidential and be used for research purpose only. About 45 minute was required to conduct each interview.

Data analysis

After completing the field work, the data were edited and transferred from the Questionnaires into worksheet as a database file. The variable names within the database file refer to the numbers of each question in the questionnaire. To measure the performance of improved and local banana varieties were carried out is based on the analysis total costs and returns. The production cost analysis is explained below.

Farm Costs Analysis

The farm cost analysis is based on improved and local banana varieties. The results of this study will provide for the comparison of total costs and returns of improved and local banana varieties. Total costs consist of expenditure from the profit and loss account variable, fixed and opportunity costs for farm-owned factors of production.

The estimation of these opportunity costs must be considered carefully because the potential income of farm owned factors of production in alternative uses is difficult to determine. In the short run, the use of own production factors on a family farm can provide flexibility in the case of low returns when the family can chose to forgone income. However, in the long run opportunity costs must be considered because the potential successors of the farmer will, in most cases, make a decision on the alternative use of own production factors, in particular their own labor input, before taking over the farm. To indicate the effects of opportunity costs, we have to separate opportunity costs from the other costs. For the estimation and calculations, following procedure is adopted to examine the performance of improved and local banana varieties in Balochistan.

Total revenue

Total revenue is the total money received from the sale of any given quantity of output. The total revenue is calculated by taking the price of the sale times the quantity sold (Biz, 2002). Total revenue = price x quantity

Total costs

Total Cost is the sum of the fixed cost and total variable cost for any given level of production, i.e., fixed cost plus total variable cost. Agricultural costs are often divided into various categories. Some of the more commonly used cost concepts are as follows.

Total fixed costs

Total fixed costs are the costs that do not change with the level of production. For example, the cost of owning a building is incurred regardless of whether the building is empty, half full, or overflowing.

Total variable costs

Total variable costs are the costs that change in direct proportion to changes in volume. Variable costs can be avoided by not producing. For example, the cost of feed to feed animals is a variable cost. If the animal is not purchased, no feed costs are incurred, but the fixed costs of the livestock building are still incurred.

Opportunity costs

Opportunity costs are the cost of using a resource based on what it could have earned if used for the next best alternative. For example, the opportunity cost of farming his own land is the amount he could have received by renting it to someone else (Hofstrand, 2005).

Profit

Profit calculates by gross income minus expenses.

Accounting profit

Accounting profit is the value that remains after all expenses except opportunity costs have been subtracted from gross income. It is the same as “net farm income”.

Economic profit

Economic profit is the value that remains after all costs, including the opportunity costs of the operator's labor and capital, have been subtracted from gross income. It is as same as “return to management” (Hofstrand, 2005).

Gross margin

A gross margin is calculated by taking variable costs away from the gross income earned from an enterprise. Gross margins are often reported on a per rupees basis for cropping enterprises.

Gross margin = returns – variable costs

Analysis of Break Even Point

The break-even point is where the total revenue equals the total cost. In other words, it is where profit equals zero. The break-even position will change according to changes in either the total costs or the total revenue. The main advantage of break-even analysis is that it points out the relationship between cost, production volume and returns.

It can be extended to show how changes in fixed costs, variable cost relationships, commodity prices, and revenues, will affect profit levels and break-even points. The break-even analysis is most useful when partial budgeting or capital budgeting are to be undertaken. The major benefit for using break-even analysis is that it indicates the lowest amount of business activity necessary to prevent losses (BIZ, 2002).

Break-even yield

The break-even yield is the minimum yield for the farm to be profitable. The formula for computing the break-even yield is: Break-even yield = Total cost/Output price This yield is necessary to cover all costs at a given output price (Markus 2006). For example, total costs (cash costs + non cash costs) = Rs. 30,000/acre, output price = Rs. 600/mds. Therefore, break-even yield is = 50mds/acre.

Total cost = Cash cost (variable cost+ fixed cost) + Non cash cost (depreciation+ opportunity cost).

Break-even price

The break-even price is the output price needed to just cover all costs at a given output level, and can be found from the equation (Markus, 2006). Break-even price = Total cost/Expected yield.

For example, the break-even price would be Rs. 30,590/acre divided by 632 md/acre is equal to Rs. 48/mds. Note that the break-even price is the same as the cost of production (FAO, 2006).

Result and discussion*Farm Size of the Sample Respondents*

It is important to examine how resources are managed, and resulting impact on productivity and sustainability. The empirical literature indicated that, small farmers have an advantage in labor supervision over large farmers. Therefore, the quantity of labor inputs is likely to be higher on small farms. Second, small farmers can have restricted access to modern input, and this can hold back their productivity, third, small and large farmers may differ in their attitude to risk and uncertainty. The large farmers may be more willing and able to carry greater risk. Results showed that 46.51 percent of respondents had less than 12.5 acres, followed by 27.91 percent have more than 25 acres and 25.58 percent have more than 12.5 – 25 acres in table 2.

Table 2. Operational Land Holding of Selected Growers in Lasbella District.

Farm size groups	Tehsil				
	Bella	Uthal	Winder	Hab	All
Small (< 12.5 acre)	7	19	8	6	46.51
Medium (>12.5-25acre)	5	8	4	5	25.58
Large (>25 acre)	4	11	6	3	27.91
All	16	38	18	14	100.00

Source: Survey data, 2017-18

Analysis of Production Cost and Profitability

Banana growing is regarded as a business which involves several aspects from production to marketing that a miscalculation in any of the operational steps would main a business failure. The profitability of banana growing is measured in terms of ratio between the production costs and output level. The role played by efficient management is to provide

conditions that favor the growth and fruitfulness of the plantation and ultimately maximizing the net return on investment. It should be borne in mind that heavy expenditures coupled with high yield of high quality fruit is more profitable than cheap care with low yield of inferior fruit quality (Source: Bureau of plant Industry).

The Center for Sustainable Agriculture Research and Education (SARE) sites that “Production costs tend to be lower in established organic systems because of reduced input costs. One exception to this, perhaps, is labor. Organic farming systems are often more labor intensive because of increased time spent managing weeds and monitoring pests.” Information from SARE is accurate with the compiled research, supporting that organic farming is less expensive, but only marginally so. (Haque, 1998) conducted a research Bangladesh Agricultural University (BAU), Mymensingh during October 1987 to November, 1988. He examined the economic performance of banana production.

He found that per hector cost and net return of banana production were taka 103, 614.88 and 1, 61, 386.12 respectively. Further the cost of production of banana orchard at the initial stage involves cost of land development, labor utilization and input application. Land development needs the most attention and time. (Khushk A.M and Cheema I, 2008), they were reported the total cost per acre for banana production it has been found that average cost per acre is around Rs66,300.

(Rahman and Akbar, 1989) conducted a study on Banana marketing in Narsingdhi District. They reported that the farmer’s share of the consumer’s taka spent on bananas varied between 42 to 62%. The intermediaries appropriated a marketing margin of 38 to 56% from marketing cost and profit. Bairagi (1980) conducted a study to determine the profitability of banana production in Jhenaidah District of Bangladesh. He found that per hector costs and returns on banana production were taka 53714.50 and 116674.84 respectively. Kamal, 1996 conducted a survey in some selected areas of Jaypurhat and found

that banana production was more profitable than sugarcane. Per hectare net returns of banana and sugarcane were taka 67650.10 taka and 10980.66 respectively. Roy, 1996 conducted a study that comparative economic analysis of banana and their crops production in Mymensingh district to determine the cost and return as well as the relative profitability of banana growers. He observed per hectare gross expense of banana production with intercrops was taka 65583.13, while per hectare gross return, net return above gross expenses is stood at taka 11191297.24 and 12514.11 respectively. Nargis, 1997 conducted a study on comparative economic analysis of growing banana and banana with other vegetables in some selected area of Muktagacha Thana. The major findings of the study were that per hectare costs of production of sole banana were taka 121438

and taka 92011, respectively considering full cost and cash cost. Costs have been broken down in a variable, fixed and opportunity costs (depreciation and opportunity) costs for production factors that are owned by the Banana growers. The overall cost of production of banana was Rs. 117474, 119132, 99146 and 111650 per acre in Bella, Uthal, Winder and Hub tehsils respectively and overall cost of production was Rs.111850 per acre in the study area. Result revealed that highest cost of production recorded in tehsil Bella followed by other tehsils. Further result indicated that overall gross revenue was Rs. 186173 per acre obtained of Uthal banana growers and they received highest net income from other study areas in table 3. The Bella banana growers obtained less net income due to shortage of water and high electricity loadshedding during the study year.

Table 3. Cost of production of Banana Crop in the study area (Rs/Acre).

Practices	Tehsils				
	Bella	Uthal	Winder	Hab	All
Land Preparation Cost	14648.5	8374.93	11766.4	7400	10547.46
Seed/Sucker Cost	3750	4185.31	3017.5	4000	3738.20
Sowing Cost	1600	2428	1840	1600	1867.00
Thinning /Hoeing Cost	9000	10034	7661	13406	10025.25
Weeding/cleaning Cost	7395.61	8837.22	6534.34	9750	8129.29
DAP Cost	15868	20061.9	13377	16893.8	16550.15
Urea Cost	12000	12292.4	7123.48	9375	10197.72
Others Fertilizer Cost	0	659.1	750	1500	727.28
Rs/acre Fertilizers Application Cost	1110	1275	1040	1341	1191.50
FYM Cost	5442.86	5621.98	3572.64	3593.75	4557.81
FYM Application Cost	500	386	363	500	437.25
Pesticide Cost	4561	5215	4782	4413	4742.75
Irrigation Charges	9440	7967	6664	9833	8476.00
Irrigation Application Cost	11322	8918	9792	10125	10039.25
Harvesting + Loading Charges	4517	5126	4463	3900	4501.50
Transportation, Un-loading & Material Cost	7479.45	7224	6493.2	5957	6788.41
Commission Charges @6%(Rs)	8839.35	10526.4	9906.77	8062.37	9333.72
Total Expenditures	117473.77	119132	99146.3	111650	111850.5
Yield (Kgs/ac)	4533	5160	4638	4455	4696.5
Sale Price/kg (Rs)	35.12	36.08	35.6	36.5	35.825
Gross Revenue	159199	186173	165113	162608	168273.3
Net Income	41725.23	67040.8	65966.7	50958.1	56422.71
Cost Benefit Ratio	1.36	1.56	1.67	1.46	1.51

Source: Survey data, 2017-18.

Overall Sharing Cost of Production

Cost of production refers to the outlay of funds for the procurement of necessary inputs and labor employed. As banana cultivation needs higher amounts of inputs as compared to other field crops, it is a capital intensive enterprise. The overall total cost of banana cultivation per hectare was Rs. 111850.52. The result indicates the fertilizer cost of banana contributed to

highest share (28.64%) as compared to others total production cost. Details of cost and share of different factors of banana production are given in Table 4.

Supply Chain of Banana for Local Markets

Marketing plays important role for the easy disposal of the product from producer ultimately to the consumer.

Due to low storage life in ordinary condition, easy and safe disposal of the commodity after harvesting is imperative. Supply chain of banana for local markets can be understood by following flow chart. This flow chart shows various steps of supply chain of banana for local markets:

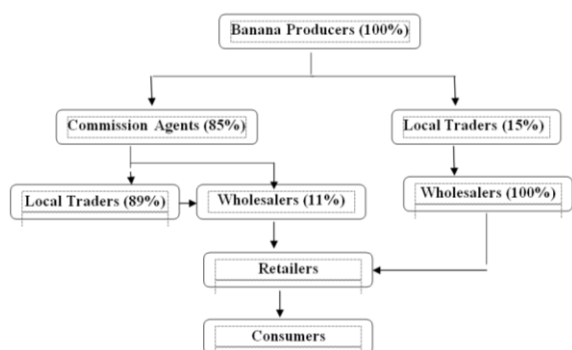


Table 4. Overall Sharing Cost of Banana Production/Acre (Rs/acre).

Particulars	Overall	Share (%)
Land Preparation Cost	10547.46	9.43
Seed/Sucker Cost	3738.20	3.34
Weeding/Cleaning Cost	8129.29	7.27
Fertilizer with FYM Cost	32032.98	28.64
Pesticide Cost	4742.75	4.24
Irrigation Charges	8476.00	7.58
Labour Cost	28061.75	25.09
Marketing/Transport Charges	16122.14	14.41
Total Expenditures	111850.52	100.00

Source: Survey data, 2017-18.

Break-even yield and break-even price

This analysis examined the break-even yield and break-even price of Banana production. The break-even yield is carried out by dividing total costs by the average price. To calculate the break-even price, total costs are divided by the average yield. The average break-even yield 3345, 3302, 2785 and 3059kgs per acre for the Bella, Uthal, and Winder and Hub tehsils respectively. The average break-even yield was higher in Bella tehsile per acre followed by other Banana producing tehsils, which is calculated from average total costs per acre divided by the average price perkg. Break-even yield means that the Banana growers must receive this yield to cover the costs related to Banana production. Considering the break-even price analysis, the break-even price is the price a producer must receive minimum for a product in order to cover the entire costs associated with the production of the product (Hofstrand, 2005).

The average break-even prices of the different Banana growing tehsils are different Banana growing tehsils has an average break-even price per kg is Rs. 25.92, 23.09, 21.38 and 25.06 in Bella, Uthal, Winder and Hub tehsils respectively in table 5. Therefore, the continuing production until the banana is a good choice because Banana growers start making profit from price of minimum per kg.

Table 5. Break-even yield and price of banana crop.

Banana growing tehsils	Unit				
	Average Total Cost	Average Price/kg	Average Yield/acre	Break-even yield/acre	Break-even Price/kg
Bella	117474	35.12	4533	3345	25.92
Uthal	119132	36.08	5160	3302	23.09
Winder	99146.3	35.6	4638	2785	21.38
Hab	111650	36.5	4455	3059	25.06

Source: Survey data, 2017-18

Conclusion

The main purpose of this study is to conduct detailed investigation of banana production and marketing systems in Lasbella District, to identify the technical and socioeconomic constraints in production and marketing system which have an impact on the expansion of its production and marketing, to quantify the market margins of producers and other market intermediaries; and assess ways and means to improve the producer’s share and consumer’s surplus and to develop policy recommendations for efficient production and marketing system to safeguard the interests of producers as well as consumers. Despite of some limitations, the findings of the study confirm that the farmers can obtain positive net return from cultivation of banana. In the context of income generation and poverty alleviation, production of crop like banana may play a crucial role in meeting the cash needs of the farmers. The findings of the study also revealed that the trading of banana is a profitable venture to different intermediaries. The profit of retailers was higher than that of other intermediaries and the profit was found reasonable. But the marketing efficiency was not good in the study area. The gap between the producer’s price and consumer’s price was huge and the producers do not get their reasonable price for their product, on the other hand the intermediaries especially the retailer’s net marketing margin is high enough and ultimately the

consumers are the main sufferer of this marketing system. For this reason, the Government should take an effective step to control the price system and price spread of the market and make sure that the producers can get their reasonable price and also the consumer can also get the product in a reasonable price. Measure should be taken to improve the knowledge of a farmer to the modern cultivation technique and encouraged them to adopt the new technology to increase the production. Banana is not only important source of nutrition but also an important source of cash income to producers and traders. So the farmers and intermediaries could be more benefited financially if production and marketing of banana are to be well expanded.

Recommendations

Production of plants through tissue culture techniques by establishing tissue culture labs in major banana-producing areas can result in healthy plants and consequently better yield. Establishment of cold storages in banana producing areas and markets may enhance the life of the fruit and thereby income of the farmers. The prices of inputs such as fertilizer are needed to be kept at reasonable level for its frequent application and improved yield. There is also need to carry out research for producing high-yield varieties and improving shelf-life of the fruit. Exploring of new banana markets and encouraging local traders for better packing by providing attractive packing material can enhance export of the fruit. Banana cultivation is a highly labor intensive, therefore labor force needs to be arranged prior to plantation. For better quality banana production these workers need to be properly trained on various aspects of improved banana cultural practices including banana bunchy top virus disease management. Plantation managers use knowledge of these stages to implement farm practice and manage productivity.

This includes matching fertilizer and irrigation requirements to plant growth, proper sucker selection, timely plantation & harvesting, proper nutrition management of banana orchards and identifying when key pest & disease management practices must be applied.

Suggestions

The government should be open Hab dam and reduced the electricity loadshedding for increasing the banana area. The government should provide relief to the local growers of fruit crops by providing them essential infrastructure facilities like farm to market road, cold-storage houses, and regular and sustainable supply of electricity in order to enhance production and export of quality fruits. There is a need to overcome the scarcity of water through construction of check/delay action dams in suitable areas of the province. The micro-irrigation systems need to be introduced widely to cope with problem of water shortage in fruit growing areas of the province. Steps should be taken to check adulteration of pesticides, as the adulterated pesticides adversely affect the quality of fruits. The ARI should organize regular visits to the orchards and provide guidelines to local farmers on the problems, which arise during various stages of production. The experts should also introduce high yielding, and drought and disease resistance varieties of fruits. Balochistan has tremendous potential for development of horticulture, particularly the fruit farms. Serious efforts needed to be directed for bringing about a shift from traditional to a technology-based farming system. The government should extend credit to small farmers for horticulture development. The lack of finance does not enable the cash-starved small farmers to harvest and market their fruit crop. The small farmers' access to loan facility should be ensured.

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