

Cost and Revenue of Apple Production in District Killa Saifullah of Balochistan

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Abstract:

The present study was carried out to estimate average total cost and revenues of apple production per acre in district Killa Saifullah of Balochistan province of Pakistan. Apple is main grown fruit of the study area. The study aimed at estimating the average total costs related with its production and the revenues generated per acre. The results of the study showed that the average total cost of apple production per acre was found to be 103827 PKR with major share of transportation cost accounting about 32% of the total average cost. Total revenue on average was found to be 242489 PKR with a production of 811 apple boxes per acre. Similarly the average profit was estimated be 138662 PKR per acre. It was suggested that the government and other institutions should enhance their activities in the area to aid the financial and technical position of apple growers so that the production of apple could be maximized.

Key words: Cost, Revenue, Estimation, Apple, Killa Saifullah.

1. INTRODUCTION

The apple is the *pomaceous* fruit of the apple tree, species *Malus domestica* in the rose family *Rosaceae*. It is one of the most widely cultivated tree fruits. The tree is small and deciduous, reaching tall, with a broad, often densely twiggy crown. The leaves are alternately arranged simple ovals 5 to 12 cm long and broad on a petiole with an acute tip, serrated margin and a slightly downy underside. Blossoms are produced in spring simultaneously with the budding of the leaves. The flowers are white with a pink tinge that gradually fades, five petaled, and in diameter. The fruit matures in autumn, and is typically diameter. The center of the fruit contains five carpels arranged in a five-point star, each carpel containing one to three seeds. The tree originated from Central Asia, where its wild ancestor is still found today. There are more than 7,500 known cultivars of apples resulting in a range of desired characteristics. Cultivars vary in their yield and the ultimate size of the tree, even when grown on the same rootstock. (Wikipedia, 2014).

Table 1.1 Taxonomy of apple

Kingdom	Plantea
Order	Rosales
Family	Rosaceae
Genus	<i>Malus</i>
Species	<i>M. domestica</i>

Source: Wikipedia, 2014.

About 63 million tonnes of apples were grown worldwide in 2012, with China producing almost half of this total. The United States is the second-leading producer, with more than 6% of world production. The largest exporters of apples in 2009

were China, U.S., Turkey, Poland, Italy, Iran, and India while the biggest importers in the same year were Russia, Germany, the UK and the Netherlands. In the United States, more than 60% of all the apples sold commercially are grown in Washington. Imported apples from New Zealand and other more temperate areas are competing with U.S. production and increasing each year. Most of Australia's apple production is for domestic consumption. Imports from New Zealand have been disallowed under quarantine regulations for fire blight since 1921. Other countries with a significant production are Brazil, Argentina, Ukraine, Germany and South Africa.

Table 1.2 Top ten apple producing countries of the world (2012)

Rank	Country	Production
1	China	37,000,000
2	United States	4,110,046
3	Turkey	2,889,000
4	Poland	2,877,000
5	India	2,203,000
6	Italy	1,991,312
7	Iran	1,700,000
8	Chile	1,625,000
9	Russia	1,403,000
10	France	1,382,901

Source: UN Food & Agriculture Organization, 2012.

Top five apple producing countries of the world include China, United States of America, Turkey Poland and India. With a production of 620 thousand tonnes Pakistan is world's 20th largest apple producing country (UN Food & Agriculture Organization, 2012).

Balochistan is the key contributor of Apple production in Pakistan and while KPK stands on second number with contributing 25 percent of national Apple growth. After Baluchistan and KPK, Punjab province also contributes in Apple's production as its upper part Potohar and Muree also produce Apples. Azad Kashmir is also a renowned place of

apple growth and Kashmir's apple is used as term because of its taste (Dostpakistan.pk, 2013).

Apples are generally known as the "sweet gold" of Pakistan and are among the most popular fruits. According to the Pakistan Bureau of Statistics, during 2012/13 apples were produced over an area of 110,000 hectares with a total production of 556,000 metric tons, placing Pakistan among the top 25 producers globally. Apples are grown at higher elevations and/or northern latitudes in a several provinces and areas of Pakistan. Per capita production of apples is just three kilos. Major apple varieties in Pakistan include Golden delicious, Red delicious, Kala Kulu, Kaja, Gacha, Amri, Mushhadi, and Kashmiri.(Raja, 2015).

Balochistan is called "Fruit Garden of Pakistan" because of the production of finest quality fruits. The quality of deciduous fruits produced over there is as good as anywhere in the world. This province contributes about 64% of the total apple fruit production of Pakistan (Govt. of Pak., 2006). The climatic conditions and higher altitudes of Quetta, Ziarat, Pishin, Kalat, Loralai, and Zhob districts of Balochistan are highly conducive for the plant growth and quality production of this fruit. However, in Pakistan, the average yields of horticultural crops are estimated to be only one-third to one-fifth of proven potential (Ahmad, 1994).

1.1 Importance of the study

The study helped to find the cost and revenues and the important factors that have major share in the cost of production of apple. Apple is the major source of income of most of the farmers of the study area. The findings of this study will be helpful for the researchers in future.

1.2 Objectives of the study

The main objectives of the study were:

- To estimate costs and revenues of apple production in the study area.
- To assess percentage share of inputs in total cost of production of apple in the study area.
- To suggest recommendations on the basis of the findings of the study.

2. MATERIALS AND METHODS

2.1 Universe of the study

District Killa Saifullah is famous for the fruits production in the province as well as in Pakistan. The villages namely Kan Mehtarzai, Nasai, Kanchogi and Batozai are producing fine exporting quality of apples and were selected as study universe. The reasons behind selecting these villages are that, mostly in district Killa Saifullah apples of fine quality are grown in maximum quantity, secondly these are located near the main city market of district Killa Saifullah.

2.2 Sample Size

The Random Sampling technique was utilized to select the apple growers in the study area. This technique was used because it provides equal chances to every apple grower to be allocated for interview. A total of forty respondents of apple growers with equal proportion were randomly selected from Kan Mehtarzai, Nasai, Kanchogi and Batozai villages of district Killa Saifullah.

2.3 Data collection procedure

The primary data regarding cost and net revenue of apple production was gleaned from the respondent on prescribed questionnaire. The respondent replied to the questions asked during the interview regarding the apple production. The technique of interview was face to face interaction method.

2.4 Data Analysis

The collected data was punched in computer and software such as SPSS and Excel were used to analyze it. Featured analyses include frequencies table, cross tabulation and other simple budgeting techniques.

2.5 Analytical Framework

According to Debertin (1986) grower's profit (Net Revenue) is equal to total revenue (TR) minus total cost (TC).

$$\Pi = TR - TC$$

Where

$$\Pi = \text{Profit}$$

$$TR = P \times Q$$

$$TC = p \times x$$

Where

$$P = \text{Price of output produced}$$

$$Q = \text{Quantity of output produced}$$

$$p = \text{Price of input used for production}$$

$$x = \text{Quantity of input used for production}$$

Apple profit function specification

$$\Pi = TR - TC$$

Where

$$\Pi = \text{Profit}$$

$$TR = \text{Total revenue of apple production}$$

$$TC = \text{Total cost of apple production}$$

3. RESULTS AND DISCUSSIONS

3.1 Distribution of respondents in the study area

The total sampled respondents of apple growers in the study are presented in table 3.1. The data were collected from the four villages of district Killa Saifullah. Ten respondents from each village were selected randomly for the study.

Table 3.1: Distribution of respondents in the study area

Village	No. of respondent
Kan Mehtarzai	10
Nasai	10
Kanchogi	10
Batozai	10
Total	40

Source: Field survey, 2014

3.2 Category of apple growers on land size basis

The table below illustrates the range of land size for apple in the study area. The maximum area of land owned by respondents was found 32 acres for apple production while the minimum area of land under apple production was 0.5 acres.

Table 3.2: Land size frequencies

Land under apple production (acre)	Frequency
0.5	6
1	9
1.5	7
2	5
2.5	3
4	4
16	5
32	1
Total	40

Source: Field survey, 2014

3.3 Land Tenure system

Land tenure system gives the complete picture of the farmers' ownership and tenancy. From the sample population of the 40 respondents 16 respondents are owner while 8 and 16 were tenant and owner cum tenant respectively. Table 3.3 shows the land tenure status of the respondents.

Table 3.3: Frequencies of land tenure system

Land system	Frequency
Owner	16
Tenant	8
Owner cum tenant	16
Total	40

Source: Field survey, 2014

3.4 Educational level of the respondents in the study area

It was observed that the educated farmers are more responsive to the modern technology and production practices than illiterate. Education level of the farmers was considered as a good measure of flexibility of the farmers in adopting better production practices. It was found that majority (20) of the respondents in the study area was illiterate while the respondents having educational level 1-5 year, 6-8 years and 9-10 or above years were 7, 9, and 4 respectively in the study area.

Table 3.4: Educational level of the respondents in the study area

Illiterate	1-5 year	6-8 year	9-10 or above	Total
20	07	09	04	40

Source: Field survey, 2014

3.5 Cost of production of apple per acre in the study area

The cost of apple production incurred on cost of Land Preparation, Fertilizers, Irrigation, Pesticides, Picking, Packing, Labors and Transporting.

Table 3.5: Average cost of apple production of per acre in the study area

Factors of Production	Total (PKR)	Cost	Percentage share in Total Cost
Labor for land preparation	4170		4%
Fertilizer	5360		5%
Pesticide	8800		8%
Labor for other activities	4140		4%
Picking	8855		8%
Packing	30818		29%
Loading/Unloading	1622		1.5%
Transport	34062		32%
Misc. Expenditure	6000		5%

Total Cost	103827	100%
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Source: Field survey, 2014

3.5.1 Land preparation

The first and important step for apple production is land preparation that enhances water holding capacity of soil for long time and also it maximize the ability of plant to get required nutrients from the soil. The estimated average cost of per acre of land preparation came to be 4170 PKR which was 4% of the total cost of apple production.

3.5.2 Fertilizer and pesticides Cost

Chemical fertilizers are the important inputs. It makes the soil more fertile and has direct impact on the yield. Fertilizers like Winter oil, Urea, DAP, SOP and MPK are commonly used by growers in apple production. The estimated cost incurred on fertilizers and pesticides of per acre land was 14160 PKR, which was 13% of the total cost.

3.5.3 Picking and packing

Picking and packing are the final and very important activity in the production of apples. Picking includes labor cost, and the average cost of per labor is 460 PKR per day. The packing of apples require an expert labor to box it whose cost is higher than picking labor cost which is approximately 800 PKR per day. The average total cost of one acre land was 8,855 PKR, which was 8% of the total cost while the average packing cost of one acre land was 30,818 PKR, which was 29% of the total cost. The high percent share of packing means that this is the expensive operation used in the production of apples.

3.5.4 Transportation and loading/Unloading cost

Transportation of apple from the farm to the market includes transportation cost and loading and unloading of apple boxes to and from the truck. The average estimated transportation cost

per box was 42 PKR and the estimated total transportation cost of one acre land was 34,062 PKR which is 32% of total cost of apple production. The estimated loading/Unloading charges per box were 2 PKR while the total estimated cost was 1,622 PKR which is 1.5% of total cost of apple production.

3.5.5 Total cost of apple production

The total cost of apple production includes variables cost used in production and marketing cost including transportation, labor, loading/unloading and market charges. The estimated total cost of one acre land of apple production was found to be 1,03,827 PKR.

3.6 Total revenue

The estimated total revenue of apple production in the research study was 2,42,489 PKR. The quantity of apple box produced and sold were 811, while the price estimated for one box of apple was 299 PKR.

Table 3.6: Average per acre revenue of apple

Quantity of apple boxes	Selling price per box	Total revenue
811	299	2,42,489

Source: Field survey, 2014

3.7 Total profit

The total profit function for apple equals to Total Revenue minus Total cost, that is 2,42,489 - 1,03, 827, which gives a profit of 1,38,662 PKR to the apple grower. While the profit gained by the grower is 170 PKR per box. The estimated production of apple was 811 boxes per acre.

Table 3.7: Average per acre profit of apple

Total Revenue	Total Cost	Profit
2,42,489	1,03,827	1,38,662

Source: Field survey, 2014

4. SUMMARY, CONCLUSION AND RECOMMENDATIONS

4.1 Summary

The study was carried out in district Killa Saifullah to find out the total cost of production, net revenue and production of apple boxes per acre in the study area. For this purpose 40 apple growers were randomly selected and interviewed. The study revealed that the average total cost of production per acre of apple in the study area was 1,03,827 PKR, which includes land preparation 4%, Labor cost 4%, Fertilizers and pesticides cost 13%, Picking 8%, Packing 29%, Loading unloading cost 1.5%, Transporting to the market cost 32% and miscellaneous activities cost shares 5% to the total cost of apple production. According to the research study the total production of one acre land of apple garden in district Killa Saifullah was 811 apple boxes, having 299 PKR selling price of each box. The total revenue from one acre land of apple garden was 2,42,489 PKR and the profit per acre was 1,38,662 PKR.

4.2 Conclusion

On the basis of findings of study it can be easily concluded that the total cost of apple production includes land preparation cost, labor cost, picking and packing cost, fertilizers and pesticides cost, transporting, loading/unloading cost and marketing entry charges and commissions. Transporting practice account for the biggest cost of production sharing 32% to the total cost of production followed by packing cost 29% and picking cost 8%. The total profit and the production per acre can be increased if apples growers of the area use effective fertilizers and pesticides in optimum recommended quantity.

4.3 Recommendations

On the basis of the findings of the study following recommendations are forwarded for the decision makers to

enhance apple production in the study area. Since majority of apple growers is poor and they cannot afford effective fertilizers and pesticides along with other inputs due to high cost, it is therefore recommended that the government and other funding organizations should provide more and more financial compensations to the apple growers to utilize their resources in optimum way and generate maximum profits at lower costs. Field days and demonstration on apples should be carried out in the study area by the extension officers and workers to enlighten the apple growers with the benefits accrued from the used of improved varieties of apples. Furthermore, the apple growers need to be fully aware and trained by the extension personnel in the use of certified and optimum use of fertilizers and pesticides and recommended improved production practices.

LITERATURE CITED

- Ahmad, S. 1994. Plant propagation. In: O. Mayers, G.M. Khattak, H.R. Mian, M. Ayaz, E. Bashir and R. Bental (Eds.). Horticulture. National Book Foundation, Islamabad, Pakistan. pp. 187-213.
- Anonymous. (2013) Apple production in Pakistan. Available online at: <http://www.dostpakistan.pk/pakistan-worlds-10th-largest-apple-producer/> Visited on: 25/12/2014.
- Anonymous. (2014) Apple. Wikipedia the free encyclopedia. available at: <http://en.wikipedia.org/wiki/Apple>. Visited on: 25/12/2014.
- Debertin, D. L. 1986. Agricultural production economics. 2nd edn. Macmillan Publishing Company, New York, USA. 413p.

GoP. (2006) Agricultural Statistics of Pakistan, Ministry of Food, Agriculture, and Livestock. Food and Agriculture Div. Planning Unit, Islamabad.

Raja, R. and D. Williams. (2015) Apple product brief. Assessment report to USDA foreign agricultural services. GAIN Report: 1501.