

Analysis of Return on Investments – A Special Study on Apple Industry of Jammu & Kashmir

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Abstract

Purpose- The purpose of this paper is to analyze the cultivation costs and returns from the apple orchards owning to various sources of marketing/selling undertaken by apple growers in Jammu & Kashmir.

Design/methodology/approach- The study was carried out in apple producing districts of Jammu and Kashmir by selecting respondents through multi-stage sampling design. Various financing/credit sources as well as marketing channels were evaluated and opinions of peasants related to input/cultivation costs and returns from the marketing of fruit were evaluated by using mean and percentile methods.

Findings- Results show that irrespective of the marketing channel used, the cultivation costs are same. Choice exercised by peasants in selecting a particular marketing channel and location depends on the nature of contract signed by peasants while raising the credit for effective farming. The flexibility related to marketing and peasant's contact with market is more where the financiers are institutional sources. Thus the returns are more in direct marketing of fruit as compared to other marketing channels. Further, the study provides the insights about the opportunity losses in selecting the cultivation of apple in compared to other crops such as wheat, paddy etc.

Research implications- Marketing is the main function which decides the returns from the investments. So the present study provides the insight about the variances in returns across various marketing channels. The results will help the peasants to decide on the choice of crop to be cultivated on the land and the marketing channel to be used for selling of fruit to earn maximum returns. For government the study will help to devise the efficient marketing infrastructure and take the measures to provide technical and scientific approaches to reduce the input costs and help the growers to earn maximum to increase the gross state domestic product.

Research Limitations- The possible limitations of the study are that data includes only five districts of Jammu & Kashmir and study is confined to apple cultivation and marketing, so results may not always fully generalize to all regions of India, for all situations.

Keywords- Apple, Institutional Sources, Moneylenders, Flexibility, Marketing, Financial Returns, Jammu & Kashmir.

Introduction

This study reflects the practices and costs associated with a production

system for traditionally grown apples in the Valley of Kashmir. While every effort is made to prepare a model of production system based on real world practices but this cannot be the concrete model for all circumstances as the practices are specific to each orchard and may vary from region to region within the state. Production practices and management techniques are generally individualized to meet the specific needs of each grower. Therefore, this study should be interpreted as a representative operation and not as a universal reference for production of apples in any region. Costs are represented on an annual per kanal basis.

The orchard in this study is assumed to have been established as a conventional orchard for apple production. It is considered to have completed the gestation period which is usually 5 to 7 years and the tree under consideration are assumed to be the fruit bearing. Crops grown in transition years may not be considered as the source of revenue because during this period the labour costs for maintaining the orchard and developing it are comparatively high and the income generated from the intermittent crops subsidizes the costs involved.

Apple (*Malus domestica* Borkh) is one of the most important fruit belongs to the family Rosaceae and sub-family Pomoidae. Being a temperate fruit contributes 80% cent of the world's supply. In India commercial cultivation of apple is largely confined to the state of Jammu and Kashmir, Himachal Pradesh and Uttarakhand which together accounts for about 2.5 per cent of world production (Ahsan et al., 2008, Wani et al., 2009). It is estimated that all horticulture crops put together cover nearly 11.6 million hectares in India with an annual production of 91 million tones. Though, these crops occupy hardly 8% of the cropped area in India with approximately 30% contribution in agricultural GDP (Datta 2013).

As a dominant crop of the valley "Apple" proudly represents the fruit industry of Kashmir, representing 98% of the total fruit production. Between 1974 – 75 and 2008-09, the area under apple has gone up from 46190 hectares to 1332810 hectares. Kashmir apple has lived up to its reputation for being one of the choicest fruits. Kashmir has for long been considered the home of apples (Bhat 2013). Horticulture is gaining momentum in the state as its contribution to GSDP remains around 7-8 percent over the past few years (DES J & K 2016-17).

The horticulture in Jammu and Kashmir State is one of the oldest industries and constitutes yearly Rs.5500 crores (i.e. 7-8 % of the GSDP) to the state economy. The horticulture sector in the state accounts only for 13 % of the net-sown area but contributes 45% of the state's agricultural GDP. It

provides employment to around 7 lakh families comprising of about 33 lakh people who are directly or indirectly associated with this sector. Each hectare of orchard generates employment of 400 man-days per year i.e. 13.80 crore man-days per annum. Area under fruits in the state has increased from 3.25 lakh hectares in 2010-11 to 3.38 lakh hectares in 2016-17. The production has increased from 17.13 lakh MTs in 200-18 to 22.35 lakh MTs in 2016-17, reported an increase of 30.47%¹.

Almost all apples produced in India are used for fresh consumption with limited use of processing. The fruit is transported to and sold in India's largest whole sale fruit and vegetable markets like Azadpur Delhi followed by Mumbai, Bangalore, Ahmadabad, Kanpur, Jaipur and other small scale fruit selling outlets. Marketing of apple in valley of Kashmir is carried out by private sector comprising of pre-harvest contractors, commission agents, forwarding agents, wholesalers and retailer chains. Earlier commission agents were playing a dominant role in marketing, now an orchardist has a number of alternate marketing channels to choose from.

There are number of marketing channels patronized by the apple growers. But the choice of selling through particular marketing channel is affected by source of finance preferred by grower. The marketing channels mainly operating in the valley of Kashmir are as follows.

Channel (1): Producer- commission agent- Wholesaler - Retailer - Consumer.

Channel (2): Producer- Money lender - Commission agent- Wholesaler- Retailer - Consumer.

Channel (3): Producer- Pre harvest Contractor- Commission Agent – Wholesaler - Retailer- Consumer.

Channel (4): Producer-Wholesaler - Retailer- Consumer.

Objectives of the Study

—To prepare operational cost sheet for the present industry,

—To analyze the return on investments on the Present Industry.

Research Methodology

For the collection of primary data, multistage sampling design was used to cover various geographical regions of the state. Four districts namely Shopian, Kulgam, Anantnag & Baramullah from valley and district Doda from Jammu region were selected. On an average five apple producing villages were selected sharing good heritage of apple production. Conveniently, respondents from each village were selected and mainly 10-15

orchardists" (families) from each village. Apart from the door-to-door study, the respondents were randomly selected in the various horticultural meetsⁱⁱⁱ organised by government and commercial banks operating in the region

and money lenders associated with the horticultural lending practices were also taken into consideration to collect primary data.

Table 1:- Sample Design- Selection of Village

Region	Major Apple Producing Districts	District Selected	Villages Selected
Jammu	Doda, Kishtwar, Ponch, Ramban	Doda	Pooneja, Dandi, Rutna, Bhalra, Chakka.
Kashmir	Anantnag, Bandipora, Baramullah, Budgam, Ganderbal, Kulgam, Kupwara, Pulwama, Sopian, Srinagar	Anantnag	Larkipora, Achabal, Shanghas, Nowgam, Gopalpora
		Baramullah	Palhalan, Sopore town, Kleri, Rafiabad, Nowpora
		Kulgam	Palnool, Zaban, Katapora, Kokergund, yaripora
		Shopian	Awneera, Reban, Loosdenew, chetragam, zainapora

Operation Cost Sheet Formation and Analysis.

The objective of our research is to prepare operating cost sheet for industry. So in this section we will discuss briefly operations in cultivation of apple in orchard and associated costs with those operations.

The following is a description of general assumptions pertaining to sample costs for apple orchard analyzed in this study.

Land: Average land holding of growers in the Kashmir is 0.69ⁱⁱⁱ hectares. Other factors such as fertility and drainage are considered as constant. The land is non depreciable so its value is not changing and value may vary from region to region.

Orchard Establishment: The establishment cost is sum total of costs associated with land preparation/ development, plantation, plugging, cash overhead and production expenses for growing trees through the first year that apples are harvested (year 5-7). As stated above usually cash crops cultivated during gestation period subsidize overhead costs required but costs associated with fertilizers, horticulture mineral oil sprays and pesticides are considered as the financial obligation over growers.

Trees: Trees are purchased from nursery owners. These are present for sale in market in the months November-December and February and March. The average cost of

trees varies from rupees 100 to 300.

Irrigation: Irrigation is done mostly through canal system which is by already set. The remaining hilly train areas where natural irrigation system is not found need the mechanical engines and water pumps for irrigation. The average water pump used for such purposes costs around 5000 rupees.

Production Practices:

The activities related to production are categorized into the following.

Fertilizers: The basic and most important input for production of apple is fertilizers. Various types of fertilizers are applied for fruit enrichment and plant growth and development.

Recommended utilization of various fertilizers

It was found that usually three types of fertilizers are mainly Urea, DAP and MOP are essential for the growth and development of plant. The fertilizers recommended by horticultural scientists on per plant basis are given below.

Table 2:- Quantity of fertilizers applicable.

S. No.	Type	Quantity per Tree
1	Urea	0.80 kg
2	DAP	0.44 kg
3	MOP	1.24 kg

In comparison to above recommendations, the field investigations revealed that rupees 2122 are invested on the fertilizers in one kanal of apple orchard.

Spray Schedule: The spray schedule includes list of pesticides and fungicides which are applied on orchard for fruit growth, enrichment and keeping it free from pests and other diseases. The schedule is a document which shows recommendation of inputs from horticultural department and is published every year by department for assessment of growers.

To improve quality of produce and protect delicious fruit from various diseases, application of pesticides and horticultural mineral oils is inevitable. The recommendation from horticultural scientists for application of pesticides is given as below.

Table 3:- Pesticides recommended by the horticultural experts.

S. No.	Type	Quantity per Tree
1	Hexacanazole	2.6 liters
2	Myclobutanil	0.54 kg
3	Captan	4.96 kg
4	Chloropyripl	1.52 liters

As considered to be another important factor for production, the amount invested on the pesticides and fungicides in one kanal of orchard land was found rupees 8736.

Floor/Ground Management: The ground management activities and works which are necessary for orchard establishment. They include barbed wire, drainage channels, grass and weeds removal, clearing leaf falls etc.

Harvesting:

Harvesting season starts from the month of September and is requiring huge amount to carry out harvesting and post harvesting activities. Labour requirements of various categories are more required in this season. So season of harvesting poses large financial obligations on growers. Following are main activities which are carried out during harvesting.

a) **Apple Plucking:**^v When fruit has ripened, plucking starts to make it available for consumption in market. The labor required is usually semiskilled that are familiar with process.

b) **Grading:** After plucking apples are put in small heaps to process for next activity such as cutting^{vii} of lut (stem). After doing that apple is graded into various categories based on size of apple and quality. The labour required is skilled and should be familiar with the process.

c) **Packaging:** This is most important activity because this involves experts who are well versed with packaging art and activity is capital intensive. Because final price of apple in market is dependent on art of packaging apple. This activity is value enhancement activity in industry. The requirements for packaging are corrugated boxes or wooden boxes, paper straw, ink etc.

Transportation: The transportation is divided into two.

One local transport from orchards to truck loading locations. Second from there to national or local markets where selling of produce takes place. In second form of transport, the freight is deducted in market from gross sale of fruit box. While as in the first (local) transport, carriage is paid from pockets by grower. Thus posing need for immediate capital.

Cash Overhead: The above mentioned activities are all requiring cash reserves to carry out them effectively. So growers require cash to purchase inputs, packaging materials and labour overheads to carry out functions.

Non-Cash Overhead: The non-cash overheads involve efforts of grower to arrange facilities and arrangement of refreshments for all kind of labour involved in production, harvesting and post harvesting management activities.

Equipment Cash Costs: the equipments required during production include, spray pump set, water pump, tub, pipe,

farming equipments, plastic sheets, small load carriers and trolleys etc. In case of harvesting, ladders, buckets, grading and packaging sheds, equipments to add value of the fruit etc are required.

So the above mentioned activities are capital intensive and thus are considered as input requirements for effective production of fruit in Kashmir valley. The assessments of these costs is done in below given Performa which is specially designed by us to understand costs associated with fruit production activities of valley of Kashmir.

Furthermore, operating cost sheet shows variable costs required during production of apple. The fixed costs are not shown in cost sheet. This is done because equipments lost for more than one harvesting season and are used again and again. So their costs are deducted over a long period of time.

OPERATING COSTS SHEET

(Costs for production activities per year per Kanal)

(Prices discussed with Experts, Assumed 150 boxes of approximately 18 Kg per box and 30 trees per Kanal^{viii} of Land)

Activity	Price (Rs)	
Pruning	2500	
HMO Spray Oil		3000
Fertilizers (Figures from Field Data) ^{ix}		2122
Pesticides (Figures from Field Data) ^x		7222
Labor ^{xi} Overheads		
1. Family (Figures from Field Data)	9000	
2. Hired (Figures from Field Data)	4681	15681
Packaging Boxes. (150*40) ^{xii}		6000
Local Transport. (@5*150)		750
Miscellaneous Overheads. (@15*150) ^{xiii}		2250
Total		39191

So from the above analysis of input cost requirements, approximately, 40000 rupees are needed for one kanal of orchard land to carry out production process effectively.

While as institutional financing sources under scheme of KCC provide only 35000 rupees on per kanalland, which is not fulfilling requirements healthily.

Calculation of Interest Charged by Money Lender ^{xiv}

Particulars	Amount (Rs)	
	Loan in Cash	Loan in Kind
Average Rs Charged Per Box ^{xv} (Figures from Field Data)	30.00	30.00
Unreturned Market Commission ^{xvi} (8% on market price of box ^{xvii})	56.00	56.00
Profits on Boxes	--	2.00
Pesticides ^{xviii}	--	2.25
Fertilizers ^{xix}	--	1.00
Miscellaneous ^{xx}	1.00	1.00
Total	87	92.25

Income Generation per Kanal Analysis (Roi Analysis)

In this section, we shall try to analyze returns from marketing of fruit through various marketing channels. The analysis shall help us to draw conclusions about efficiency in terms of marketing returns from various channels. Further, as we know that selection of marketing channel is dependent on the selection of the financing intermediary. So this will help to reveal about efficacy of both

institutional and non-institutional financing sources the finance.

The analysis of returns has been done on one kanal of the orchard land and expected market price in all channels has been kept constant i.e., 800 rupees. The expected produce from one kanal of land is taken as 130 boxes of apple.

Statement showing the return from one kanal of land.

Particulars		Amount(Rs)
Production costs on one kanal of land		40000 ^{xxi}
Price of apple box taken as		800
A Gross sale of produce from one kanal of land assuming 130 boxes from one kanal of land	800*130	104000
B Less		
Fright ^{xxii}	100*130	13000
12% market commission raised	12% of 800*130	12480
Miscellaneous overheads ^{xxiii}	10 * 130	1300
Total B		26780
Net profit A-B	104000-26780	77220

Returns from one kanal of land = $77220 - 40000^{\text{xxiv}}$ = Rs. 37220

$$ROI = \frac{\text{Gains} - \text{Investments}}{\text{Investments}} \quad ROI = \frac{77220 - 40000}{40000} = 93\%$$

Case I (If grower is independent on financier in selling of the fruit.)

Returns from one kanal.....Rs. 37220

Add 8% of raised commission back.....8% of 800 = 64*130 = 8320

Net Return..... $37220 + 8320$ = Rs. 45540

$$ROI = \frac{\text{Gains} - \text{Investments}}{\text{Investments}} \quad ROI = \frac{45540}{40000} = 114\%$$

In this case raised market commission of 8% out of 12% is returned back. So loan is raised from the institutional financing source or grower is not raising any loan for production of apple. The returns are higher than non-institutional sources of financing sources.

Case II (Advances raised from Moneylenders/ commission agents)

Returns from one kanal of land..... Rs. 37220

Because here the moneylender don't return 8% of the raised market commission to grower. The returns are less than institutional sources if chosen for financing. Because in this case grower is dependent on moneylender for selling of fruit.

Conclusion

It is evident from the above analysis that the returns are higher in situations where grower is independent in selling of produce. Because in that case, the grower is not liable to extra raised marketing commission. Situations where grower is self-reliant in selling of apple, it is possible only when grower is either financially sound in meeting production expenditure on his own or grower raises the credit from institutional source of finance. Because, as discussed in earlier chapters, the institutional sources of finance are not intervening in choice of selling by the growers. Results show that irrespective of the marketing channel used, the cultivation costs are same. Choice exercised by peasants in selecting a particular marketing channel and location depends on the nature of contract signed by peasants while raising the credit for effective farming. The flexibility related to marketing and peasant's contact with market is more where the financiers are institutional sources. Thus the returns are more in direct marketing of fruit as compared to other marketing channels. Further, the study provides the insights about the opportunity losses in selecting the cultivation of apple in compared to other crops such as wheat, paddy etc.

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Research Limitations

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Endnotes:

1. Economic Survey J&K2013-14 Directorate of Economics & Statistics, Govt. of J&K
2. Head of family was selected as respondent.
3. Fruit growers associations. Kissan Mela.
4. Digest of Statistics, Govt. of Jammu and Kashmir
5. Jk horticulture department
6. Commonly known as "TsuntWaaen"

7. Laatkanchi. (let's assume 5% extra profit)
8. 1 Acre = 8 Kannals. If average amount used on pesticides per kanal is Rs. 5000 (Figures from Field Data)
9. Average of before finance fertilizers & after finance Fertilizers. $(1455+2122/2)$ Then pesticides costs on per box of apple = $7000/150 = 45$ (Avg. production/Kanal=150 boxes)
10. Average of before finance pesticides & after finance pesticides. $(5708+8736/2)$ 5 % of 45=2.25
11. Labor= Packaging, spraying, Ground Management , Apple Plucking Grading etc 19 Working Note – 2:
12. Average cost of Box Rs. 40. Average amount used for fertilizers (Figures from Field Data)Rs. 3000
13. Paper, Straw, Nail, Ink, Pen, Paper, Refreshments. Fertilizers per box apple = $3000/150 = 20$
14. On the basis of group discussion with orchardists and Expert views. 5 % of 20 = 1.00
15. “Aarti” in Kashmiri. 20 Paper charges, Mailing charges, Telephoning Charges etc.
16. %age of Commission which is returned to seller after final settlement of accounts (usually 8%) 21 As calculated in chapter 4.
17. Average market price is taken as Rs. 700 22 Freight from Kashmir to the national market. Taken as rupees 100 per box of apple approximately.
18. Working Note -1: 23 Mailing charges, unloading, paper costs, hot and cold charges etc.
- Assume 5 sprays in season 24 Less operating costs.
- Usually few % of prices are charged by the money lender on inputs.