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Economics of Apple Cultivation "With Special Reference to South Kashmir- India"

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Abstract:
Horticulture occupies very important position in the predominantly agricultural economy of western Himalaya, among all the fruits grown in the Kashmir, Apples are most widely planted and is commercially the most important fruit crop. In this background a close look at the economics of apple cultivation become highly relevant for study to determine the costs, the cultivation of apple crop in Jammu and Kashmir shows particular interest for a number of reasons. In terms of both area and production, apple is very beneficial fruit crop. Apple is an extremely important source of nutritive diet, this provides a major source of income and employment also, It's production in Jammu and Kashmir and its marketing all over the country as well export promotion to other countries by several government initiated programs and policies e.g. price policy credit policy, supply of packing boxes, quality control etc. but their impact positive or negative, remains a topic of considerable controversy
Key words: Economics, Apples, production, costs

Objectives

- To examine the Apple production and its input- output relation in south Kashmir
- To estimate the one year costs and returns from matured apple orchards

Hypothesis

Ho: There is no any relationship between some variable inputs and out puts of apple production in south Kashmir

Methodology

The Jammu and Kashmir is purposively selected for study purpose as it has 35.92 percent and 58 percent of country total area and production respectively about 50% of apple production comes from south Kashmir like Anatnag, pulwama, Shopain and Kulgam, among shopain is second in case of apple production after district Baramullha, and is very famous for its quality apple. Hence south Kashmir is selected for the study. From each district, six village per district are taken into consideration and in every village two apple growers were selected randomly, accordingly 24 apple growers are selected for present study, as the age of apple plant is a crucial factor in determining the cost and benefits, up to the age of seven years there is not any output from apple trees except some marginal side crops. Therefore middle aged 16-20 years of apple orchards were investigated for primary survey.

Hence keeping in view the objectives of study, the data collection was carried out both at primary and secondary level. At primary level data was collected by face to face interviewing the apple growers personally with the help of schedule prepared for the survey purpose. The secondary data were collected from planning commission India, Department of Horticultural and Directorate of Economic and statistics Jammu & Kashmir state. Analysis tools were basically tabular analysis, percentage collection, t-test and cost-benefit analysis.

Table No 1:1 District wise Area and Production of Apple crops in south Kashmir during 2009-10

Fruit	Districts	Production	% Share of Apple	Area	%share in Area (Apple)	Productivity
Apple. Other Fresh	Shopain	196191 7845	96.15%	20383 1269	94.13	9.63 6.18
Apple. Other Fresh	Kulgam	106663 8595	92.54%	13347 1362	90.74	7.99 6.31
Apple. Other Fresh	Anantnag	109384 11348	90.60%	13347 1967.5	87.30	8.04 5.76
Apple. Other Fresh	Pulwama	93454 2634	97.25%	7821 596.2	92.91	11.94 4.41

Source- Department of Horticulture Jammu & Kashmir **Note**: Production in (MT) and Area in (Hectors)

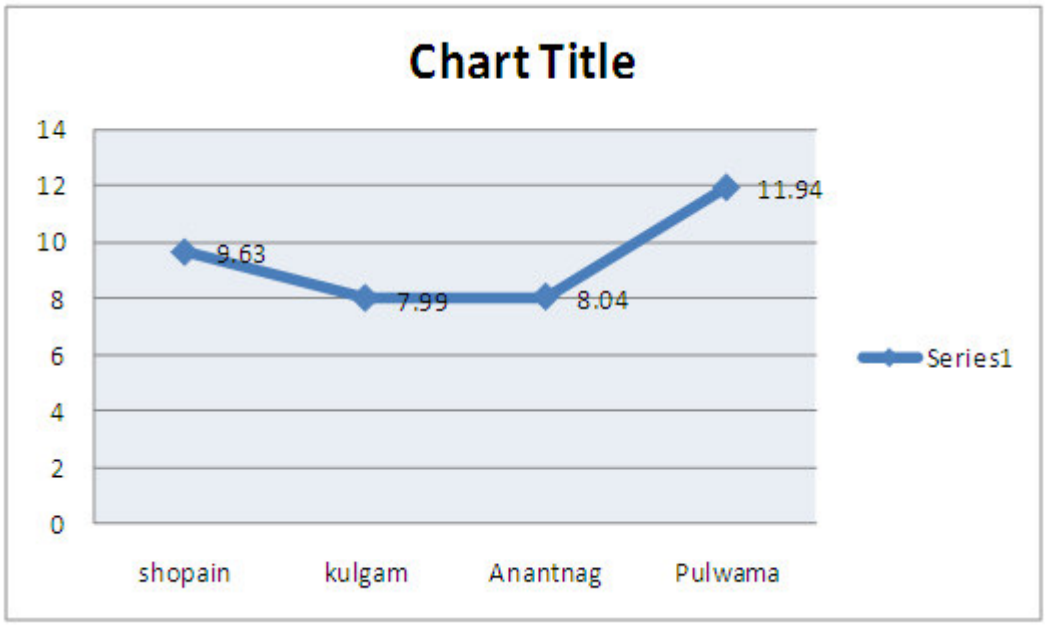

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Figure 1. Productivity trend of Apple crop in south-Kashmir

Table No 1.2 Production and Productivity of Apple crop in Jammu & Kashmir state

Year	Apple cultivation (000 Ha)	Apple Production (000 MTS)	Productivity (Mt/Ha)
2004-2005	107.93	1093.33	10.12
2005-2006	111.88	1151.34	10.29
2006-2007	119.04	1222.18	10.26
2007-2008	127.80	1311.85	10.26
2008-2009	133.10	1332.81	10.01
2009-2010	139.04	1336.79	9.61
2010-2011	141.72	1852.42	13.07

Source: Directorate of Horticulture planning and Marketing J&K, "Agriculture Production Department Jammu & Kashmir."

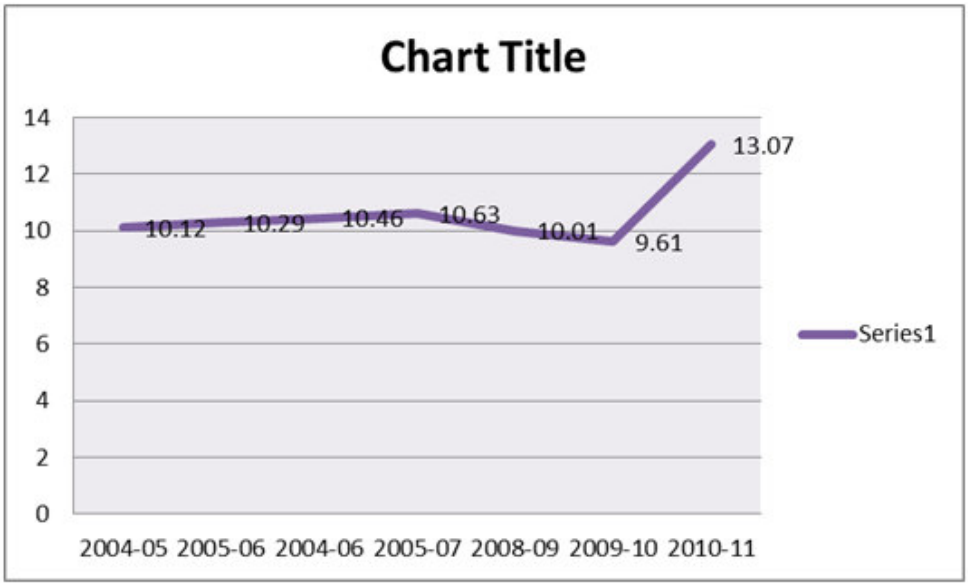

Figure 2. Graphical Presentation of Apple Productivity in state

Results and Discussion

Production and productivity:

The state has the largest potential for production of quality temperate horticulture crops. It has created niche production of apple, pear, cherry and dry fruits. Among temperature fruits apple ranks first position in terms of production and productivity. The annual production of apple in the state is about 9.09 lack tone at an average yield of 10.09 tone per hectare. However the production & productivity of apple crop has been fluctuating during last two decades, this is due to drought or some other climatic conditions. In spite of this apple production has increased from Just 6000 metric tons in 1950-51 to more than 18 lack tone in 2010-11, productivity is much higher than national level of 6.86 Mt/Ha and also compares well with the world average of 10.82 ton/ha or china (9.93 ton/ha) which is world highest producer of apple.

As we analyze in south Kashmir which constitutes shopain, Kulgam, Anantnag and Pulwama, the production of apple were highest in distract shopain having 196191MT in 2009-10, constitutes 96.15% of total fresh fruit. The increase in production was due to increase of area under cultivation because diversification of agriculture land in to apple orchards, this district contributes about 17 % of total production in Kashmir valley within the coverage of 16% of total apple orchards in the valley, other three districts of south Kashmir are comparatively highly productive than other districts of state except the state district Baramullaha. The productivity of Kulgam Anantnag and Pulwama in 2009-10 was 7.99 8.04 and 11.94 respectively which was also higher then national level.

Cost and Returns from an orchard

Apple is the most important fruit crop among temperate fruits. After plantation, it takes about 7-8 year to reach bearing stage. Initial investment on this crop is quite heavy on account of the cost involved in digging, pits, application of manures and fertilizers, cost of plants, transplanting etc. On an average 250 trees are planted (13 trees per Kannel) in a hectare. The growers have to incur costs on maintenance for about 7-9 years. The main items of maintenance are, cost of manures, fertilizers, pesticides, Pruning and preparation of basins etc. The selected age group of our sample was 16-20 years. This age is considered as high yielding age for any apple tree, after 20 years it starting decreasing returns. In the analyses initial costs of investment has been spread over the economic life of the orchard, considering it as expected depreciation on the fixed investment.

Table No 1:3 Average initial cost of Apple plantation per kannel

S.No	Cost Components	Per Kanal cost in Rupees	% total
1	Layout, preparatory till age, digging of pits & filling of pits	400	9.74
2	Manure	600	14.61
3	Fertilizers	896	21.82
4	Plant protection	250.50	6.10
5	Cost of plants	1833.33	44.66
6	Miscellaneous	125.17	3.04
	Total	4105	100

Source - Compiled from primary survey **Note:** 1 Kanal=0.05 Hectors

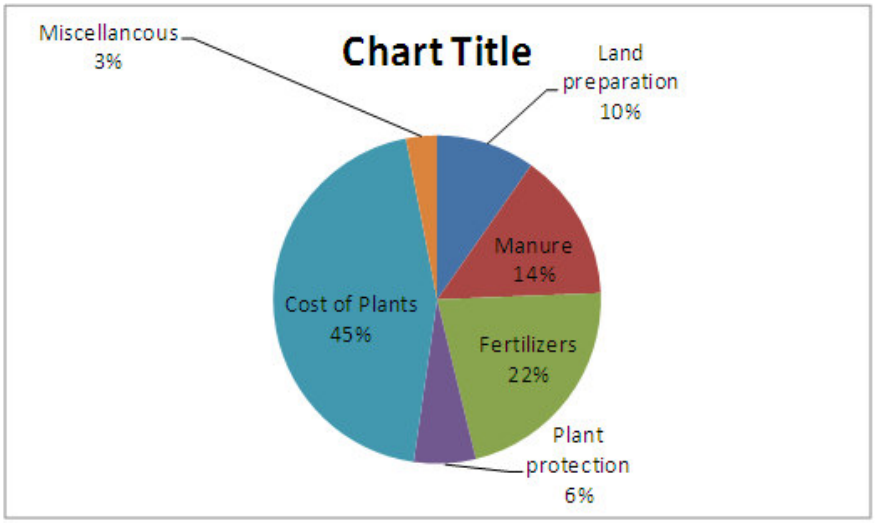

Figure 3.presentation of different initial percentage costs

On average cultivators incur Rs 4105 per kannel apple orchard, the major cost to be incurred is cost of nursery which accounts for about 44.66 percent of total initial cost, nearly 9.74 percent of total cost is incurred on layout

digging and filling of pits and about 14.61, 21.82, 6.10 percent on manure, fertilizers and plant protection of the initial investment respectively.

Table No 1.4 Average Annual Costs and Returns from an Apple orchard per Kanal

Particulars	Costs	Returns	Net Income	Output- input Ratio
Variable cost	7702.5	43341.66	25439.37	5.63
Fixed cost	10199.79	-		4.25
Total	17902.29	43341.66	25439.37	2.43

Source- Compiled from the primary survey **Note-** 1 Kannel = 0.05 Hectare and age group is 16-20, Cost and returns (rupees)

Maintenance Costs & Returns of Bearing Apple Orchard- (16-20 years age)

In the competitive world of today, a fruit grower must not only have a working knowledge of agriculture science but also be a practical economist. To make investment decisions, he must be familiar with the financial and economic concepts and methods of financial analysis He should be able to prepare farm budgets which are an invaluable tool to assess and monitor the costs and incomes from various agricultural practices and will help them to identify the areas of weakness and losses and improve the overall profitability of the farm, so to analysis the cost of production and the profitable of apple orchards, would reflect the economics of apple cultivation. The costs of apple production comprise two types of cost viz. fixed cost and variable costs. The fixed cost of apple cultivation remains almost same from the beginning of apple cultivation in all age groups (singh jaspal, etal. 2006) and in our analyses this constitutes 56.98% per kannel apple crop and comprises prorated establishment cost, rent value of land, interest of fixed capital and depreciation of fixed cost, In fixed costs the prorated establishment cost and rental valued of land are the main items which account 70% and 25% of the total items of fixed costs.

The over all "Variable cost" for maintenance of one Kannel apple orchard was estimated Rs 7702.5 Which is 43.02 %, among this human labour fertilizers, manure, pesticides and insecticides were the main items, accounting 48% of labour, 20% fertilizers, 12% manure, 15 % pesticides and insecticides and other 5% on wear and tear, interest etc of the total items in variable costs.

The study shows that the net income from one kannel apple crop was Rs 25439.37 which is equal to Rs 508787.4/hector calculated from (Total output - total input = profit or net income) or (Rs 43341.6-17902.29= 25439.37) and the output-input ratio was estimated to be Rs 2.43, taking the fixed costs constant then the output input ratio in case of variable costs is to be Rs. 5.63 shown in table No 1.4

Hence for reaching a real conclusion a net income of Rs. 2.43 is earned with investment of one rupee in this age group of apple true in south Kashmir, Jammu & Kashmir State-India.

Input-output Analyses

All the resources, material and non material which are used in the production process of any agricultural product on the farm are known as form inputs or factors a production, Therefore land, machines, fertilizers, plant protection, chemicals, labours and interest on working capital are all form inputs only those resources are included in the input function which are relatively scarce or have a financial value. Hence natural resources such as sunshine, rain water, snow quality of soil etc are not included in the term form inputs as in our analyses; all costs are calculated according to present prevailing prices per unit of input and output.

The study is based on primary data, after analyzing the data and estimating the inputs and outputs of one kannel orchard having highest peak period (16-20) years - (Singh Jaspal etal -2006) and (Kanwar Sing -1980)

Then taking the entire estimate input and output costs into account converted into simple natural log and place it in a simple regression model so our model has been taken on the line that output is a function of inputs costs thus.

$$Y = f(x)$$

Y = One year apple production in south Kashmir

X = one year total cost of apple cultivation.

Thus

$$Y = B_0 + B_1 x + {}_1$$

${}_1$ = Error term

B_0 = Efficiency parameter B_1 = Coefficient of slope

While using the model in Apple production it has been assumed that input cost has a direct impact on output of apple crop.

Hypotheses

Ho: There is not any relationship between some variable inputs and outputs of apple cultivation is south Kashmir

AS,

$$Y = B_0 + B_1 x$$

Where B_0 and B_1 are constants using the ordinary least square method (OLS) for this model our results are as under.

$$Y = 0.735 + 0.716\ x$$
$$SE = (0.251)\ (0.111)$$
SE = 0.2427 (Standard error of the estimate)
$R^2 = 0.655$
$t^* = 6.4363$

As the calculated value of $t^* = 6.4363$ which lies outside the acceptance region and the table value is 2.069 at 5% land of significance at the degree of freedom

$$t^* > t \text{ or } 6.4363 > 2.069$$

Therefore we accept our alternative hypothesis which reveals that there is positive relationship between variable inputs and output of apple production of a matured orchard (16-20) during one year.

The estimated apple production function in equation form shows that if the inputs of a matured orchard is Zero (B1) then the average level of output is to be Rs 0.735 = y and B1 which measures the slope, shows that an increase in the level of inputs by Rs 100 the estimated increase in the average output amounts Rs. 71. The value of our estimated $R^2 = 0.655$ shows that about 65% percent of variation in the output is explained by variable inputs and other 35 % variation may be from other factors like soil, fertility, climatic conditions, rainfall etc.

Summery and conclusion

Apple cultivation is profitable economic activity in the Kashmir valley compare to other agriculture food crops. It is labour intensive, farm based and commercially attractive economic activity. The income earned from this crop is much higher than any horticulture crop, if it is done is a systematic way, the various summarized points are as under;

(1) The study shows that from the past one decade the production of apples in south Kashmir has been increasing, but the productivity shows the decreasing tread which is a serious problem mainly shown in district Anantnag and Kulgam during 2009-10.

(2) Expenditure on various variable inputs in the apple cultivation leads to higher returns and was significantly more than 1: 5 ratio, which shows, there is scope for adaptation of more labour, efficient fertilizers and pesticides and other form management techniques with more returns.

(3) Another conclusion emerged in our study, that the income generation from apple cultivation was Rs. 25439.39/ Kannel or Rs 508787.4/ ha which is good indicator for economy.

(4) The study analyzed that the cultivator have to pay 45% of total initial costs on purchasing of apple plants which is the high burden for poor formers in the region.

(5) The study shows the from total outputs, 65% change come from some variable inputs so there is provision for increasing the productivity by some innovative techniques in an efficient manner.

Hence for reaching the real conclusion a net income of Rs 2.43 is earned with investment of Rs. 1.00 from apple cultivation is south Kashmir region of Jammu Kashmir state (India) but it is very little if we compare it with other apple producing countries in the world.

References

Asif, M. and Hashmi,A.H (1998), Acknowledgment Constraint, Apple Production and Marketing in SWAT, Journal of Rural Development and Administration 30:127-137

Kanwar,S.M(1988), Apple- Production Technology and Economics ,Tata Me Grew-Hill publication New Delhi-701: 739 - 40.

Masoodi,M.A(2003),Agriculture in Jammu & Kashmir- A perspective.Monisarw Book series Srinagar P. 195

Mittel,S (2007),Can Horticulture be a success story for India (ICRIER) working paper.

Robel,J. et al.(2000), Proceeding of the XIV international symposium on Horticulture Economics, st peter Port, Guernsey, UK, 12-15 September Horticulture 536 : 301 -310

Report on Horticulture Development in J&K state with Reference to Kashmir valley, paper presented in Rajasabha June - 1997.

Singh,M, et al, (2008), "Structural changes in Horticulture sector in India-Prospective for XI five year plan" India Journal of agriculture economics V. 63-No3

Singh,V.B, et al.(2006), Horticulture for Sustainable Income and Environmental Protection., Concept publishing company, New Delhi.

Wani, M.H. et al.(1998), Economic Analyses of Different Age Orchards in Apple Agriculture situation in India 48(9) - 657-60

Satis,Y et al.(2006),Prospects for India's Emerging Apple Market United States Department of Agriculture (USDA)

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