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Management of Krishi Vigyan Kendra Farm

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ABSTRACT

Each Krishi Vigyan Kendra has got a farm to organize production units crops, horticulture, dairying, fisheries, poultry etc. with a view to demonstrate techno economics, feasibility and social acceptability of the new technologies to the extension system and target farmers of the district. For maximization of profit, farm activities should be diversified to make the optimum use of resources and spread of risk and uncertainties for improving efficiency of a Krishi Vigyan Kendra. For improving soil productivity by balance use of organic and inorganic fertilizers, especially in wheat-paddy rotation is required as well as use of fertilizer on the basis of soil test. Consideration of residual effect of fertilizers and manures for economizing cost. Use of micronutrients where ever necessary, improving irrigation efficiency by use of appropriate time, quantity and method of irrigation. Avoiding water logging and improving drainage system, preparing an annual schedule of visitors of unnecessary scientist to the farm, better storage facilities for farm produce and area establishment for small workshop.
Key words: *Management, KVK, Profit.*

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INTRODUCTION

Each Krishi Vigyan Kendra has got a farm to organize production units (crops, horticulture, dairying, fisheries, poultry etc.) with a view to demonstrate techno-economic feasibility and social acceptability of the new technologies to the extension system and target farmers of the district. To achieve this objective, production units individually and combined should run on cost effective and profit basis[1].A good farm manager should get ideas, make observations, analyses observation, conceive problems and their solutions, take decisions, prepare an action plan, execute the plan and accept the responsibility of the outcome.

The major deficiencies in the management of the Krishi Vigyan Kendra farms are related to :-

1. Poor knowledge and practice in the production methods.
2. Lack of knowledge and application skills in the use of economic principles as applied to choice of crops and inputs, their combinations and changing decisions with changes in the method of production and product –input prices.
3. Farm may also face socio economic, administrative and organizational problems.

The present paper deals with the application of economic principles to the operation and management of a Krishi Vigyan Kendra farm.

MATERIAL AND METHODS

Basically each manager has to take 4 decisions about the farm.

1. What crops/enterprises to be organized.
2. How much of each product to be produced.
3. How much of each input to be used.
4. How to combine crops/enterprises.

1. Choice of crops/enterprises-

Choice o f crops will depend on the prevailing agro climatic conditions, availability of requisite inputs and relative profit over other competitive enterprises. Thus principle of comparative advantage will operate in the choice of enterprises.

2. **How much of each product to be produced-**

When a physical scientist such as agronomist sets up experiment to study the relationship between input and production, he ordinarily decides to study the influence of a certain number of inputs on output under fixed conditions. It means that he attempts[2] to hold part of the input constant by experimental control as shown below.

Y = f (X1 / X2 ------------Xn)

The expression says that Y (output) depends upon X1 (input). Where as other inputs (X2-----------Xn) are fixed. The letter f stands for the phrase[3] "depends upon". When variable input are more than one the following equation is developed.

Y = f (X1. X2/ X3 ---------Xn)

RESULT AND DISCUSSION

The optimum production is determined with the help of low of diminishing returns illustrated in the following example.

Table 1 : Response of wheat to Nitrogen

Units of Nitrogen (X)	TPP Qts/hec (Y)	MPP Qts / hec (Δ Y)		A.P.P. (Y / X)	Cost of addil. input @ Rs. 150 per 20 kg (Rs.)	Value addl. Output @ Rs. 300 per Qts (Rs.)
0	12	-	-	-	-	-
20	18	6	-	0.90	150	1800
40	30	12	I	0.75	150	3600
60	45	15	-	0.75	150	4500
80	47	2	-	0.587	150	600
100	47.5	0.5	II	0.475	150	150
120	46.5	-1.0	-	0.388	150	-300
140	45.0	-1.50	III	0.321	150	-450

The physical data of table 1 is depicted in fig 1

TPP = Total physical product

MPP = Marginal physical product

APP = Average Physical product

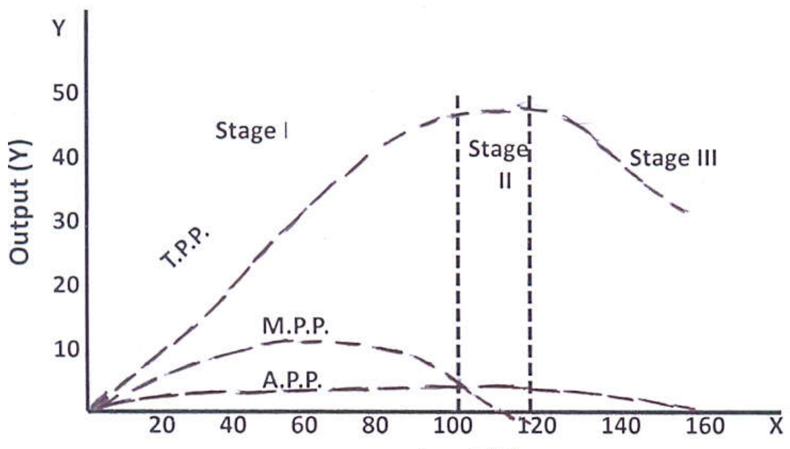


Figure 1 : An input output relationship showing average, marginal and total physical product in stage I, II and III.

The data in fig 1, shows the operation of law of diminishing return which holds that (except in very special instances) the addition of a variable input to fixed inputs first in total physical product which increases at an increasing rate (stage I), second in total physical product which increase at a decreasing rate (stage II), and third in total physical product which decreases with increases in the variable inputs (stage III).

In stage I, the M.P.P. is greater than the average and if it is known that it pays to produce at least any quantity' if follows that it pays to produce at least the maximum amount which can be produced in stage I. In stage II the M.P.P. is always less than A.P.P. thus the physical relationship alone are not sufficient to indicate the optimum rate of production. The economic question: At what point does the value of the

marginal physical product becomes equal to the cast of the input added (MR=MC). This relationship is shown in fig 2.
MVP = M.P.P. X price of Y
AVP = A.P.P. X price of X
PX_I= Price of X_I

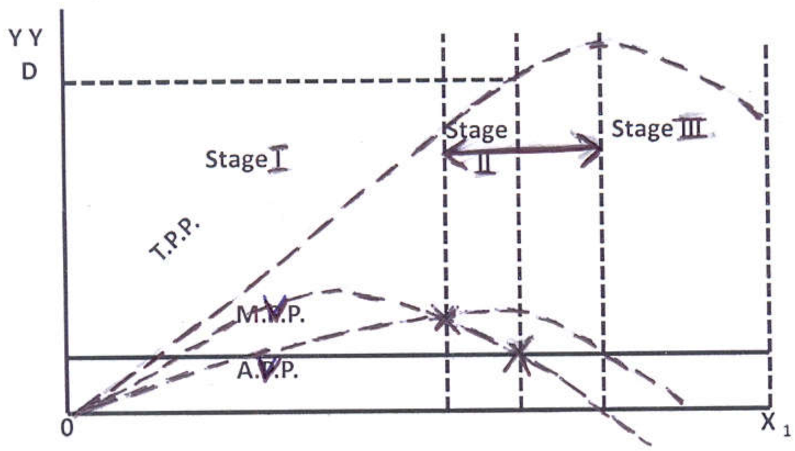


Figure 2: Diagram showing relationship between value of marginal product, total product, Average value product and price of the variable input.
It is evident from the figure that D units of Y should be produced by C units of X1 to maximize the profit. As at this point MVP (MR) = PX1 (MC).
The following generalization made from the study of above tables and figure.
Stage I. **A.** An increase in the price of X1 would lower the amount of X1 which it pays to use and hence the amount of Y it pays to produce.
B. A decrease in the price of X1 would increase the amount of x1 which it pays to use and hence the amount of Y it pays to produce.
Stage II. **A.** An increase in the price of Y would increase the amount of X 1 which it pays to use and hence, the amount of Y it pays to produce.
B. A decrease in the price of Y would decrease the amount of X1 which it pays to use and hence, the amount of Y it pays to produce.
Stage III . All changes In the use of X1 as a result of changes in prices are limited to stage II in which MVP<AVP, in which APP> MPP and in which MPP>O and MVP>O. The most profitable rate of use with in this area can only be located through the above described economizing process which insures that.
M.V.P.= PX1
Least cost combination:
When there are two or more than two variables the principle of least cast combination should be applied for determining maximum profit.
First, let us explain the following terms as they offer light to the understanding of the problems more satisfactory.

a. Isoquant/isoproduct/indifference curve.
b. Iso-cast line.
c. Isoproduct:-

Iso – product represents different combinations of two variable inputs used in the production of a given amount of output.

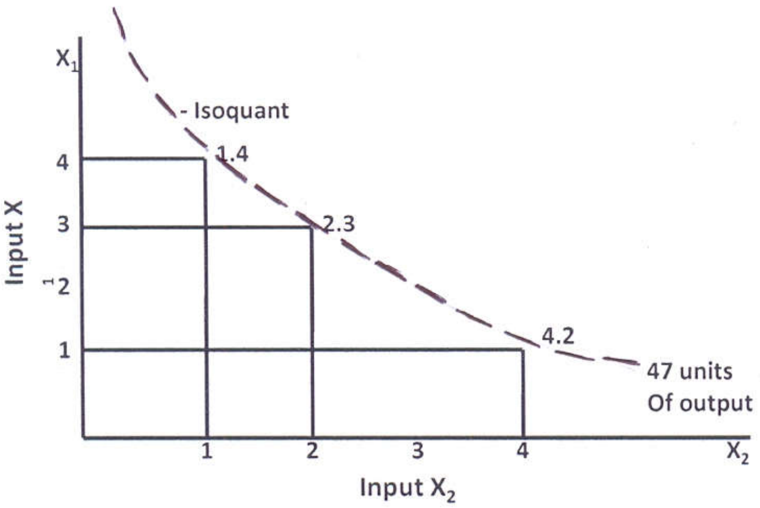


Fig 3 – Isoquant for 47 units of outputs.
In the above Fig 3, any point on the curve represents 47 units of output.

Iso-Cast line –

Iso – Cast line indicates all possible combination of two inputs which can be purchased with a given amount of investment fund.

For example a farm manager has Rs. 100.00 to spend on two inputs X1 and X2. The price per unit of X1 is Rs. 20.00 and that of X2 Rs.10.00. He can purchase either 5 units of X1 or 10 units of X2 on a diagram when these two points are joined by a straight line, it forms an iso-cast line for out lay of Rs. 100.00. Any number of X1 and X2 costing the same amount can be traced on the line. Similarly, iso-cast lines can be drawn for out of rs. 50, Rs. 100, Rs. 150 and so on.

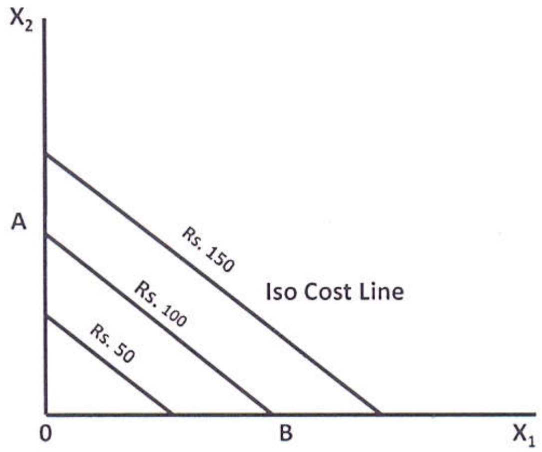


Figure 4: Iso cost line

In the above Fig 4 the length of OA is twice the length of Ob, which means that the price of X1 input is twice that of a unit of X2. Any point on the line BA represents an expenditure of Rs. 100 for the corresponding number of units of X1 and X2. The Rs. 150 line is proportionately further to the right indicating that money either X1 or X2 or both can be purchased at the price.

Combination of two inputs for producing 20 liters of milk.

Price of X1 = Rs 11

Price of X2 = Rs. 1

MRS = Marginal Rate of Substitution

Table 2: Combination of two inputs

Combination No.	Fodder Kg (X2)	Cattle feed Kg. X1	Δ X 2	Δ X 1	MRS of feed for fodder X 2 / X 1	Cost of production
1	40	0	-	-	-	40
2	24	1	16	-	16	35
3	13	2	11	1	11	35
4	6	3	7		7	39
5	2	4	4		4	46
6	0	5	2		2	55

Above table shows the decreasing rate of substitution of feed for fodder i.e. each added kg of feed substitutes less of fodder than the previous one for obtaining the given quantity of milk.
The substitution ratios are 16/1, 11/1, 7//1, 4/1, 2/1
The price ratio is 11/1 as such X2/X1 or 11/1 = PX1/PX2 or 11/1
By equating the two ratio, the level of least cast combination of the two inputs X1 and X2 is the combination of 2 units of X1 and 13 units of X2 which will give a least cost of Rs. 35 for the given level of Output.

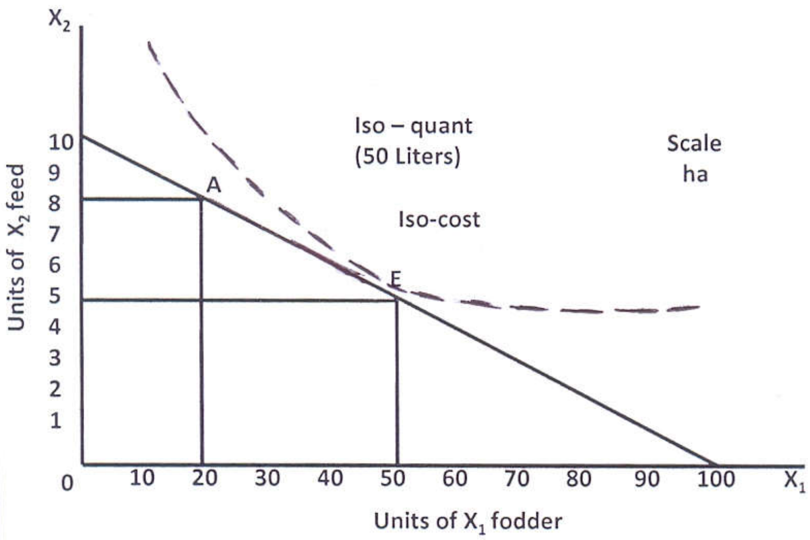


Figure 5 : Least cost combination of X1 and X2 for production of 50 liters of milk.
Fig 5 shows that the least – cost point is E. where the Iso cost line is tangent to the Isoquant. At the point of tangency, the slopes of both the curves are equal. To produce 50 liters of milk at a minimum cost. 55 units of X1 (fodder) and 4.5 units of X2 (feed) should be used at an outlay of Rs. 100.

Enterprise combination

The general equilibrium condition for a given level of inputs requires a knowledge of two relationship.

a. Iso revenue line
b. Production possibility product.

a. Iso revenue line

Iso – revenue line represents the ratio of prices of two competing products. It indicates the different combinations of two products which give the same amount of revenue or income. For example: with a given quantity of input of Rs. 100, a farmer can use it in the production of 50 units of a product Y1 and sells it at Rs. 2 per unit. He can also use it in the production of another product Y2 priced at Rs. 4 per unit, or he can produce a combination of both the line joining the point at 50 and 25 is an iso revenue line.

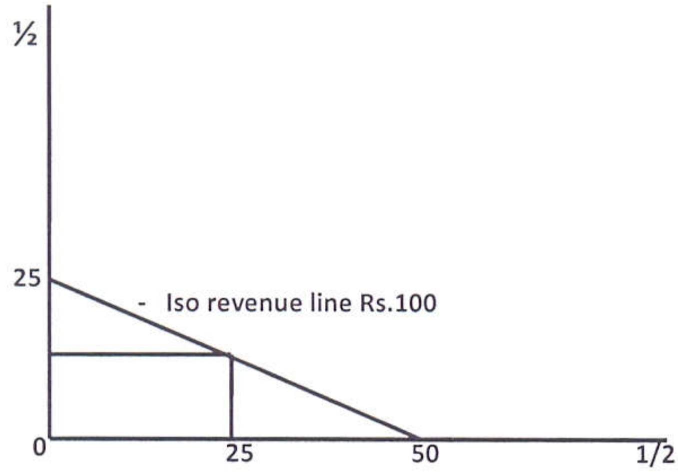


Figure 6

b. Production possibility curve

A production possibility curve is a locus of all the possible combinations of two products, which can be obtained from a given amount of resources. This curve is also known as opportunity curve or isocost curve or iso-resource curve.

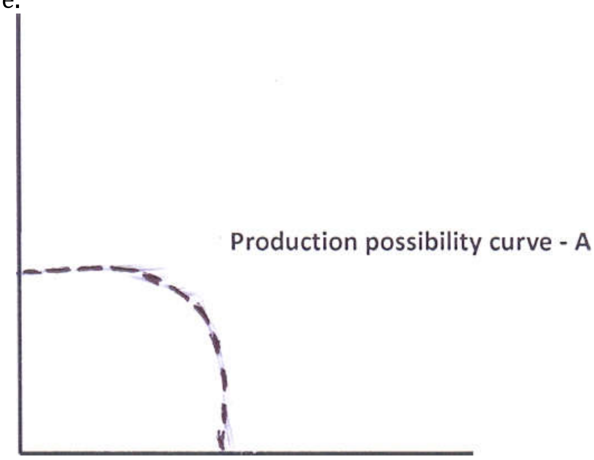


Figure 7

Optimum combination of two products

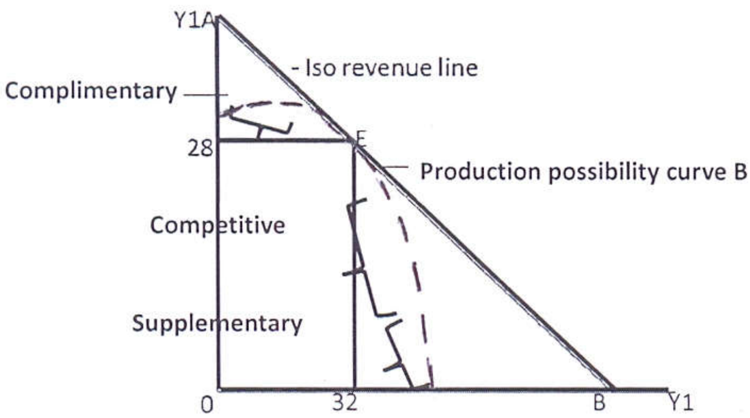


Figure 8 : Optimum combination of two products

The optimum combination of the two product is at the point E, because it is at the highest attainable revenue line . At this point of optimum product combination, the iso revenue line is a tangent to the production possibility product as has already been stated that iso revenue line is a locus of out put combination that will provide a given amount of revenue.

Enterprise relationship

Enterprises have the following relationship to each other according to their relative contribution to farm income.

1. Complementary enterprise
2. Supplementary enterprise
3. Competitive enterprise
4. Independent enterprise

1.Complimentary enterprise relationship

Complementary enterprise relationship is one which gives an element of production to the other enterprise without competing with resources. For example summer green gram followed by maize.

2.competitive enterprise relationship

Complementary enterprise relationship is one which competes with other enterprise for the same resources at the same time. For example wheat and barley or wheat and mustard.

3.Supplementary enterprise relationship

Supplementary enterprise relationship is one in which an unused resource is used for some economic activity. For example – working in kitchen garden during available off time.

4. Independent enterprise relationship

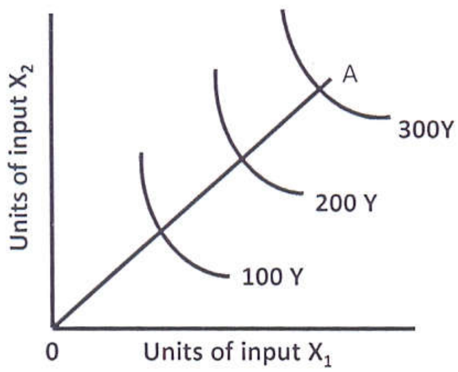
Independent enterprise relationship is one in which two or more enterprise do not compete and resources are fully available to all enterprises for example maize wheat relation.

Returns to scale :

What happens to production when all the inputs of the aggregate input are increased in the same proportion i.e. increased to scale? There are three possibilities resulting from the expansion in scale.

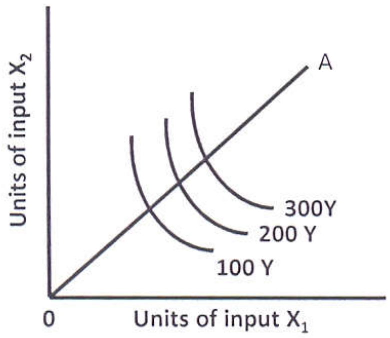
1. Increasing returns to scale
2. Constant returns to scale
3. Decreasing returns to scale.

a. Under decreasing returns to scale the successive distance of scale segment are larger and the position of Isoquants more further a part for 100, 200, 300 units. "Organizational & administrative problems are responsible for decreasing returns to scale".



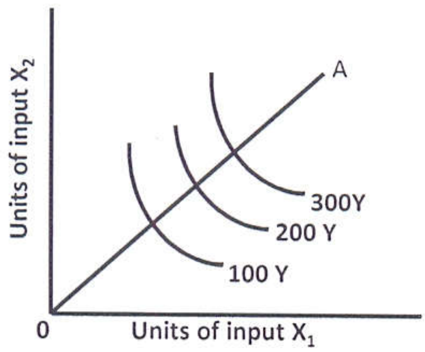
a. Decreasing returns to scale

b. Under increasing returns to scale the successive distance of scale segment are becoming smaller and smaller and the position of Isoquants is coming closer and closer. "Indivisibility of factors of production and specialization are responsible for increasing returns to scale".



b. Increasing returns to scale

c. Under constant returns to scale, the success distance of scale segment and the position of isoquant are equal in each cases. "Constant returns to scale are seldoumily attained.



C. Constant returns to scale

Opportunity cost or eqimarginal returns:

An opportunity cost is the earning from next best alternative sacrificed

Table 3 : Opportunity cost/ equimarginal returns

Sl. No.	Investment (Rs. /ha)	Profit (Rs. /ha)		
		Whaet	Potato	Grapes
1	1000	1600	1800	2500
2	1000	1500	1400	1300
3	1000	1250	1200	1200
4	1000	1100	1100	1100
Rs.	4000	5400	5500	1100
Opportunity cost : 1600+1800+2500+1500 = Rs. 7400.00				

It is clear from the table that if investment of all the Rs. 4000 is made only in one enterprise the best opportunity is grapes. However, if investment of units is made as per operation of the low of diminishing returns seen in the table the first unit of Rs. 1000 should be invested in grapes, IInd units should be invested in potato and third and fourth unit invested in wheat to maximize profits. If this principle of opportunity cost or equimarginal returns is applied, the total profit from the investment of Rs. 4000 will be Rs. 7400 which is maximum. When resource is screw the application of this principle is very important.

CONCLUSION

Diversification of Krishi Vigyan Kendra farm For maximization of profit, farm activities should be diversified to make the optimum use of resources and spread of risk and uncertainties.

Tips for improving efficiency of a Krishi Vigyan Kendra farm:

1. Diversification on the principle of opportunity cost for full utilization of resources and spread of risks and uncertainties.

2. Organization of production on the basis of optimization of resources, production Isocost and Iso revenue concepts.
3. Improving soil productivity by balances use of organic and inorganic fertilizers, specially in wheat-paddy rotation.
4. Use of fertilizer on the basis of soil test.
5. Consideration of residual effect of fertilizers and manures for economizing cost.
6. Use of micronutrients where ever necessary.
7. Improving irrigation efficiency by use of appropriate time, quantity and method of irrigation.
8. Avoiding water logging and improving drainage.
9. Restricting cropping intensity to the level when crop productivity is little higher than the breakeven point to maximize farm income.
10. Avoiding the wastage of crop by-products like paddy and wheat straw and others.
11. Better use of weed control chemicals and agricultural implements.
12. Better control of diseases and pests.
13. Working out seed rates on the basis of germination, purity percentage and real value.
14. Auction of rejected seed on market price which is always greater than the support price.
15. Proper monitoring of processing of seeds and disposal of chanas(Under sized).
16. Maintaining up to date farm records specially 34, 36 and balance sheet.
17. Preparing an annual schedule of visits of university scientists to the farm.
18. Better storage facilities for farm produce and establishment of small workshop.

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