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## Lecture 9

# Cost Concepts in Farm Management



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# Fixed cost (FC):

Fixed costs are those costs which do not change in magnitude as the amount of output produced changes and are incurred even when production is not undertaken. These are also called sunk costs. These could be fixed cash costs such as land taxes, interest, insurance premiums, permanently hired labour, etc. Non-cash fixed costs include depreciation on buildings, machinery interest on capital investment, cost of family labour & management, etc.



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# Variable costs (VC):

It shows the quantity of output that can be produced using different levels of inputs. A production function can be expressed in different ways: in written form, enumerating and describing the inputs that have a bearing on the output; by listing inputs and the resulting outputs numerically in a table; depicting in the form of a graph or a diagram; and in the form of an algebraic equation. Symbolically, a production function can be written as Variable costs (VC): The costs that are incurred on variable inputs and hence vary with the level of production are called variable costs. Higher the production more will be VC and vice-versa. Expenses on fertilizer, seed, chemical fuel consumption, etc.



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$Y=f(X_1, X_2, X_3, \dots, X_n)$  where  $Y$  is output,  $X_1, X_2, X_3, \dots, X_n$  are inputs. It, however, does not tell which inputs are fixed and which are the variable ones.

Since in production, fixed inputs play an important role, these are expressed as:  $Y=f(X_1, X_2 / X_3, \dots, X_n)$  where  $Y$  is output,  $X_1, X_2$  are variable inputs and  $X_3, \dots, X_n$  are fixed inputs.

Total costs =  $FC+VC$

Total costs (TC) are required to compute net revenue (NR)

$$NR = TR-TC$$



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# Opportunity cost:

Farm resources are limited but these can be put to different uses. When these are used in our product, some alternative usage is always forgone. The opportunity cost is the value of best alternative forgone.



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# Cost Function:

Cost function (or TC curves) represents the functional relationship between output and total cost. That is what happens to cost structure when different quantities of a commodity are produced.



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- The cost function can be represented by
  - (i) arithmetically (tabular form),
  - (ii) Geometrically or
  - (iii) Algebraically. Exact nature (curvature) of cost function depends on the corresponding production function provided the prices for inputs do not change with the quality of inputs purchased.



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- 1. Total fixed cost (TFC): The costs incurred on all fixed inputs used in production are known as TFC. These do not change with the output levels & hence represented by a straight line parallel to X axis.
- 2. Total variable cost (TVC): Refers to the costs of variable input used in production & is computed by multiplying the amount of variable input by the price/ unit of input.
- $TVC = P_X \cdot X$
- Shape of TVC depends on shape of production function.



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- 3. Total cost (TC): TC are the sum of TVC & TFC and are obtained by adding TVC & TFC for different output levels. When no variable input is used ( $TVC=0$ )  $TC = TFC$ . Shape of TVC & TC are same & depend upon the production function.
- $TC = TFC = TVC$  or  $TC = TFC + Px (X)$



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## 4. Average fixed cost (AFC):

- It is the fixed cost per unit of output & is computed by dividing TFC by the amount of output at that particular level of output. AFC varies for each level of output and as the output increases, AFC decreases. When output is zero,  $AFC = TFC$ . AFC always slopes downward regardless of production function. AFC curve declines continuously & never shows upward movement because after maximum product is achieved, input use beyond this becomes irrational.



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- 5. Average variable cost (AVC): AVC is given by  
$$TVC \div AVC = P_x \cdot X \div P_x Y = Y / X$$
- 
- AVC varies with the levels of production & its shape depends on production function. The height of AVC depends upon the unit cost of the variable input. Like AFC, AVC cannot be computed when output is zero. AVC is inversely related to APP.



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- **AVC** falls first due to cost economies of large scale production & then rises due to diseconomies of scale in production. AVC (like APP) measures the efficiency of variable input: when AVC is decreasing, efficiency of variable input is increasing; it is at maximum when AVC is at minimum & it is decreasing when AVC is increasing. As the production expands, the AVC declines initially, reaches a lowest point & then bends upwards.



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## 6. Average Total Cost (ATC)

$$= TC \text{ or } AFC + AVC$$

- ATC decreases as output increases, attains a minimum and increases thereafter. ATC is often referred to as ‘unit cost’ of production – the cost of producing the unit of output. The initial decrease in ATC is caused by the spreading of FC among an increasing number of units of output and the increasing efficiency with which the variable input is used. As output increases further, ATC attains a minimum & begins to increase, as increase in AVC can no longer be offset by decrease in AFC. ATC curve has the same slope as AVC. Difference is that the lowest point in case of AVC reaches earlier as compared to ATC.



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## 7. Marginal Cost (MC):

- May be defined as the change in TC in response to a unit change in output. That is it is the cost of producing an additional unit of output & is given by
- $\frac{\Delta TC}{\Delta Y}$  Actually a change in TC is always equal to change in VC at a given level of FC. So MC must be worked out by dividing the change in VC by the change in output.