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Original Research Article

Measurement of Farm Cost: A Study for Classification and Composition

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Abstract: Farm cost measurement has been studied, especially its types; make up; and impact on agricultural policy in agricultural economic theory. Understanding the value of farm costs is important when measuring how profitable a farm is, how productively and efficiently a farmer uses resources, the type of pricing to use, and how a farmer can achieve long-term sustainable agriculture. This study uses a quantitative and analytical method based primarily on secondary information gathered from the National Sample Survey Office (NSSO); the Commission for Agricultural Costs and Prices (CACP); the Food and Agriculture Organization of the United Nations (FAO); the Government of India's Ministry of Agriculture; and other secondary sources. This paper describes the different types of farm costs, i.e. fixed/variable; direct/indirect; cash/non-cash; as well as standard cost concepts developed in India for agricultural pricing and policy analysis; i.e. A1, A2, B1, B2, C1, C2, and C3. Another key point made in this study is to be aware that both explicit and implicit costs are equally as important when trying to determine how much a farm is economical to run. The major components of cultivation costs are: Labour, Fertilizers, Irrigation, and Equipment. Some of the key barriers to accurately measuring farm costs are poor record keeping, lack of valuation for implicit costs, regional variation, and market imperfections (imperfect markets). Thus, this study stresses that there should be; (1) standardised data collection methodology; (2) more digital technologies developed to collect data more accurately; and (3) more support from institutions, i.e. government agencies and agricultural extension service providers; in completing an accurate cost analysis of farms.

Keywords: Farm Cost Measurement, Cost Classification, Agricultural Economics, Cost Composition, Farm Profitability.

INTRODUCTION

The measurement of farm cost is an essential part in agricultural economics and is the basis for analysing the profitability of the farm, allocation of resources, and policy interventions on the farm. It includes all the explicit or out-of-pocket costs (e.g. seeds, fertiliser, labour, machinery) as well as the value of uncompensated factors of production (e.g. family labour, machinery, land). Both the cost components are important for determining the economic efficiency of the farming systems, especially in smallholder dominated economies such as India where the non-market inputs are important (Food and Agriculture Organization, 2016).

The distinction between farm costs (fixed and variable, direct and indirect, cash and non-cash) makes it easier to understand the behaviour of costs and helps in farm and policy decision making. According to John P. Doll and Frank Orazem (1984) comprehensive cost accounting is a necessary function to evaluate the efficiency of production and to maximize the use of production inputs. The Commission for Agricultural Costs and Prices (CACP) has formulated standardized cost concepts in India which are useful for cost estimation and are an important parameter used in formulating Minimum Support Prices (MSP) and formulating agricultural policies in India (CACP, 2023). Therefore, developing a system to determine the cost of farm activities and categorize and decompose them is essential to support sustainable agricultural development and the welfare of farmers.

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LITERATURE REVIEW

1. Conceptual Foundations of Farm Cost Measurement

The theoretical basis of farm cost measurement is based on the neoclassical production theory, which is based on the relationship between inputs and outputs. Previous work by John P. Doll and Frank Orazem (1984) highlights the need to consider both explicit and implicit costs to measure the opportunity cost of a resource. This view is also supported by Harold Varian (1992) who states that cost functions give important insights into efficiency, substitution possibilities and scale economies.

In agriculture, a large proportion of inputs are not market inputs, such as family labour and owned land, which is why the difference between accounting cost and economic cost is significant in this sector. It is found, the Food and Agriculture Organization (2016) states that the non-market inputs need to be imputed to enable the proper measurement of profitability and productivity. Most modern methods of farm cost analysis are based on this concept.

2. Theoretical and analytical aspects of farm cost classification

There has been a large volume of literature on the classification of the costs of the agricultural enterprise as an essential part of understanding the cost behaviour and decision-making. Fixed costs, variable costs, direct costs, indirect costs, cash costs and non-cash costs are typical types of cost categories. These classifications allow the farmer and analyst to identify the cost drivers, and to allocate resources accordingly.

Jean Delincé *et al.,* (2014) indicate there is a wide variety of ways costs are classified both between countries and between studies, associated with differences in data availability, farming systems and policy goals. The absence of some standardization is a problem for cross-country comparisons and for the need of harmonized frameworks. However, the general cost classification principles remain the same and the need to identify controllable and uncontrollable costs has been highlighted.

3. Empirical Studies on Cost Composition and Structure

Empirical studies of farm cost composition show that the ratio of different cost components vary between crops, within regions and among different adoption rates. The results of the cost of cultivation studies conducted in India show that labor and material costs form the major heads of costs, especially in labor intensive cropping systems. For example, A. Narayanamoorthy (2013) shows that higher labour expenses have a significant impact on farm profitability particularly in the case of small and marginal farmers.

Similarly, Agarwal, Yadav and Mondal (2018) conclude that labour and fertilizers costs play a significant share of the total cost in paddy cultivation. The results are in line with the empirical evidence in general, which indicates that input intensification and wage structure have an important influence on the composition of costs in developing countries.

There is also a degree of cost structure variation in the regions, as illustrated in the analyses of regional studies. Less developed areas have more labor-intensive and greater capital costs, whereas mechanised areas have greater costs of machinery. This variation highlights the need to consider local analysis of farm costs.

We will discuss four different approaches to cost estimation in this section. In this section we will discuss fore ways of cost estimation. There are various methodological approaches used throughout the literature in the measurement of farm costs such as survey-based estimation, accounting methods, and econometric modeling. Recall and measurement errors can cause survey-based approaches such as those conducted by national statistical agencies to yield detailed information on input use and costs at the expense of accuracy.

Cost behaviour and efficiency analysis can be conducted in a more rigorous manner, however, through an Econometric approach. The Cobb-Douglas and Translog models are popular cost functions that can be used in estimating cost elasticities and economies of scale. The duality between production and cost functions is very useful in analyzing the demand and substitution of inputs as pointed out by Ronald Shephard (1953).

In recent years, sophisticated statistical analysis including Principal Component Analysis (PCA) and Cluster Analysis has been applied in recognizing farm classes and the cost heterogeneity (Goswami *et al.,* 2014). These methods add more detailed analysis to cost studies, as they allow for multi-faceted variations in farming systems.

4. Policy Oriented Cost Concepts & Institutional Frameworks

Many papers in the literature deal with policy-relevant cost concepts, especially in the pricing of agricultural products. The Commission for Agricultural Costs and Prices (CACP) in India has developed a comprehensive framework for costing, which includes several cost concepts (A1, C2 and C3). The concepts are very much adopted when it comes to calculating Minimum Support Prices (MSP) and shaping agricultural policy.

Cost concept studies which are policy-oriented highlight that selection of the cost concept is important for farmer welfare and market outcomes. The shifting of cost measurement to a broader parameter like C2 as

suggested by Ashok Gulati (2018) would provide a more equitable evaluation of the cost of production and greater income security for farmers. But there are continuing arguments about the optimum cost basis for price support, and general conflicts between the interests of farmers and fiscal restraints.

5. The presentation will cover emerging issues in farm cost measurement

Climate change, sustainability and technological change are some issues that have been taken up in recent literature that need to be taken into account when measuring farm costs. The conventional framework of costs does not capture the environmental externalities, risks, and long-term resource damage. The Food and Agriculture Organization (2016) emphasizes the importance of considering environmental costs and sustainability measures when measuring food costs.

The use of digital technologies and precision agriculture is also revolutionizing cost structures by optimizing the use of inputs and monitoring farm operations in real time. All these developments call for new methods which can reflect the evolution of costs' composition and enable data-informed decision-making. To sum up, the previous literature covers the conceptual, methodological and empirical dimensions of farm cost measurement in a thorough manner. Although there is substantial development work on the standardized frameworks and analytical tools, there are some methodological inconsistencies, implicit cost valuation, and the inclusion of new problems. The literature underscores the importance of integrating theoretical insights with empirical evidence to enhance the accuracy and relevance of farm cost analysis.

Research Gap

Although an extensive literature already exists on farm cost measurement, several important gaps exist. First, the methodologies for cost classification and cost measurement vary among studies and geographic regions. Different survey designs, methods of data collection, and cost allocation approaches reduce the comparability of results, and make it difficult to create a common and comprehensive global framework, as mentioned by Delincé *et al.,* (2014).

Second, the value of indirect costs, such as family labour and owned land is still not consistent and it is frequently undervalued in empirical research. This results in biased estimates of profitability, particularly in smallholder agriculture where non-market inputs play an important role. There has been a considerable focus on opportunity costs in theory, but still a lot to be done for their application in practice.

Third, current studies address either the cost estimation or cost composition, but have rarely combined both aspects and involved advanced econometric modelling. There is limited use of full econometric models, such as translog cost functions and panel data analyses, to investigate dynamic cost behaviour and efficiency; while a number of studies have applied statistical methods.

Fourth, there's not enough consideration of regional and crop-specific differences in costs. Most national-level investigations combine data and obscure differences between agro-climatic regions, farm sizes and technological change. There are studies at the micro level but these tend to be localised and are not generalisable.

Lastly, new challenges like the climate change transition, digital agriculture, or sustainability transitions are not sufficiently represented in the current cost accounting approaches. The new farming practice calls for new methodology considering the environmental cost, risk factors, and technological innovations.

Although many theoretical and empirical studies have been conducted in the field of farm cost measurement, classification and composition, there are still numerous methodological weaknesses that are yet to be addressed in standardization of methods, valuation of implicit costs, incorporation of econometric analysis and accounting for new problems in agriculture. To overcome these deficiencies, proper cost estimation frameworks should be developed to be more accurate, comparable and policy-relevant.

Objectives of the Study

On the basis of the above research gap, the present study aims to achieve the following objectives to fulfill the gap partially:

1. To analyse the classification of farm costs into different categories such as explicit and implicit costs, fixed and variable costs, direct and indirect costs, and cash and non-cash costs.
2. To test the feasibility of the cost concepts, which have been developed by the Commission for Agricultural Costs and Prices (CACP), such as cost concepts A1, A2, B1, B2, C1, C2, and C3.
3. To explore the different types of problems faced by the farm.
4. To recommend appropriate policy actions and methodological changes to obtain more accurate, standardized and policy-relevant farm cost estimates.

RESEARCH METHODOLOGY

1. Research design and approach:

The present study is quantitative research with analytical approach that is used to analyze the measurement of farm cost, its classification, and composition in the context of an agricultural economics. The study has a descriptive and diagnostic character, with the aim of systematically categorizing costs

components and their relative importance in various farming systems. Simultaneously, it uses an econometric method to assess the farm cost determinants.

The research is based on the theories of production and cost analysis which have been formulated in the framework of neoclassical economics (Harold Varian, 1992). It also builds on the farm management principles presented by John P. Doll and Frank Orazem (1984) that stress the explicit and implicit cost dimensions of cost estimation.

2. Data Source and Data Collection:

Secondary data was used as a data source, with the inclusion of conceptual and methodological information from literature. The main sources of data are:

i. Cost of cultivation and situation assessment surveys is reported with the help of National Sample Survey Office (NSSO).
ii. Price policy reports by the Commission for Agricultural Costs and Prices (CACP).
iii. Publications of the Directorate of Economics and Statistics related to agricultural statistics.
iv. FAO databases on costs of agricultural production.

These sources are used for them as they contain detailed information regarding the use of inputs, cost components and cost structure of the crops in different regions of the country. Using standardized data sets guarantees reliability and comparability of results (FAO, 2016).

3. Sampling Framework (for Empirical Analysis):

The empirical illustration is based on a multi-stage stratified sampling framework like used in agricultural cost studies. Farms are classified according to:

i. Farm size (marginal, small, medium or large).
ii. Agro-climatic zones.
iii. Crop type including cash crops, paddy, wheat etc.

This stratification enables to include heterogeneity in the cost structure and representativeness. Such methods have been extensively adopted in the cost of cultivation surveys conducted in India (Narayanamoorthy, 2013).

4. Measurement of Farm Cost:

The study is based on the standard concepts of measurement of farm cost developed by the Commission for Agricultural Costs and Prices (CACP) which are generally used in Indian agricultural cost analysis. The important cost measures are:

Cost A1 & A2: These are the costs that are incurred, such as the costs of seed, fertilizers, pesticides, hired labour, machinery, irrigation and other materials. Cost A2 also covers rent for land leased in.

Cost B1 & B2: These costs are additional to Cost A and include interest on owned capital (excluding land) and for B2, the rental value of owned land.

Cost C1, C2 & C3: These are comprehensive cost measures. Cost C1 also contains family labour costs; Cost C2 may be considered as the most realistic total cost, and Cost C3 as a cost including a further margin for the farmer's managerial function.

The total cost of cultivation can be stated as TC = ∑ (Input Costs) + ∑ (Imputed Costs)

In this context imputed costs are the value of unpaid factors of production including family labour, owned land and capital assets, which are essential to calculating the real economic costs of farming.

5. Classification and Composition Analysis: Farm costs are categorized into the following:

By nature: Labour costs, material costs (e.g., seeds, fertilizers and pesticides), overhead costs (e.g., machinery, irrigation).

By behaviour: Fixed costs (Land revenue, depreciation) and variable costs (inputs that vary with the level of production).

By traceability: direct costs (obviously related to a certain crop) and indirect costs (related to several agriculture activities).

By payment: Cash costs (actual monetary expenses) and non-cash costs (imputed costs like owned resources and family labour).

The percentage share analysis is used in the analysis of the composition of farm cost as each cost component is the proportion of the total cost:

$$\text{Share} = \frac{\text{Cost}}{\text{Total Cost}} \times 100$$

This approach is useful to determine the major cost factors in total cultivation cost and to compare the costs of various crops, sizes of farms and regions. This analysis can be especially beneficial for policy making and cost optimization strategies, as demonstrated in works such as those by Delincé *et al.,* (2014).

6. Econometric Model Specification:

In order to study the determinants of farm cost, the study uses a log-linear Cobb-Douglas cost function that is commonly used in agricultural economics:

$$\ln C = \alpha + \beta_1 \ln L + \beta_2 \ln K + \beta_3 F + \beta_4 \ln I + u$$

Where: C = Total cost of cultivation, L = labour input, K = capital input, F = use of fertilizers and I = irrigation.

The numbers (βi) are the cost elasticities of the various inputs and express the percentage change in total cost that results from a one per cent change in each input. If the coefficient is less than one, it suggests that there

are economies of scale, and if it is more than one, it suggests that there are diseconomies of scale, according to Hal Varian (1992).

A Translog cost function can also be used to account for the non-linear inputs-output relationship, and for the substitution effect between the inputs, for robustness. It is flexible enough to allow for interaction terms and second order effects, and gives a much fuller insight into the cost structures, as originally developed by Ronald Shephard (1953).

7. Estimation Techniques:

Ordinary Least Squares (OLS) are used for estimating the econometric models. Diagnostic tests are done to help assure reliability of the results, such as: Multicollinearity (Variance Inflacion Factor), Heteroscedasticity (Breusch-Pagan test) and Autocorrelation (Durbin-Watson statistic), where necessary, robust standard errors are used to correct for heteroscedasticity.

8. Analytical Tools:

The following tools are used for analysis in the study: Descriptive statistics (Mean, percentage, ratio analysis), Look at similarities and differences between different crops and areas. The cost determination is carried out by applying econometric models. Use graphical representation (cost composition charts). These tools enable an overall perspective on the structure and behaviour of costs.

RESULTS AND DISCUSSION

Farm cost is the overall cost of the farm operation, including cash costs and the imputed value of farm resources that are owned by the farm. It includes not only the farmer's actual payments, but also the opportunity cost of factors of production such as land, labour and capital. A detailed knowledge of farm cost is important for farm profitability, efficiency and policy analysis (Food and Agriculture Organization, 2016).

1. Explicit and Implicit Costs in Agriculture

(i) Explicit Costs (Paid-out Costs): Explicit costs are actual monetary costs that farmers have during production. These include the expenses incurred on hiring labor, buying seeds, fertilizer and pesticides, irrigation charges, cost of fuel and electricity, cost of leased land and interest on borrowed capital. The costs of these relate to a direct cash outflow and can easily be measured and recorded in farm accounts. In the Indian context, these costs are very similar to Cost A or A1 in standard cost concepts (Dillon & Hardaker, 1993).

(ii) Implicit Costs (Imputed Costs): Implicit costs are the value of resources that are owned by the firm but used in the production process that do not require any payment. These include imputed value of family labour, rental value of owned land, interest on owned capital and managerial contribution of the farmer. The costs are not cash costs, but important for estimating the real economic cost of farming, as they represent the opportunity cost of resources (Kay *et al.,* 2016).

(iii) Explicit and Implicit costs are of importance: The difference between explicit and implicit costs is important in determining the actual profitability of the farm business. Explicit costs are used to determine accounting profit, but with implicit costs included, economic profit can be calculated. This differentiation is also crucial for effective resource allocation, cost management and policymaking, including support prices for agricultural commodities.

2. Farm Cost Classification

(i) Cost Concepts Approach (CACP Methodology): The Commission for Agricultural Costs and Prices (CACP) gives a systematic classification of the farm costs which are adopted throughout India.

Cost A1: All costs paid by the farmer including hired labour, seeds, fertilizers, irrigation, machinery charges, and interest on working capital. It is only explicit cost and is a starting point in cost estimation.

Cost A2: Cost A2 is the sum of the cost A1 and rental of land leased in. This will give a more reliable figure for tenants on leased land.

Cost B1: Cost B1 is the interest on owned fixed capital in addition to cost A1. This adds an element of implicit cost as it represents the opportunity cost of the farmer for the capital invested.

Cost B2: The value of Cost B2 includes the rent value of owned land in addition to Cost B1. This includes the opportunity cost of land, and provides a more comprehensive assessment of production costs.

Cost C1: Cost C1 is the sum of cost B1 and the imputed value of family labour. It is an indicator of the incorporation of the contributions of free labour in the cost calculation.

Cost C2: Cost C2 = Cost B2 + family labour. It is a full indicator of the total cost of the economy and includes both explicit and implicit costs.

Cost C3: Cost C3 is calculated by adding a margin (usually 10%) for managerial functions to Cost C2. It is frequently employed in policy making, like fixing Minimum Support Prices.

(ii) The second classification is based on the nature of the cost: The other way to categorize farm costs is based on the type of cost. Labour costs are the cost of hired labour (explicit) plus family labour (implicit). Material cost is an expense involved in the purchase of seeds, fertilizers and chemicals, usually explicit. Capital costs are the interest on borrowed capital (explicit cost) and the interest on owned capital (implicit cost). Likewise, land costs include the explicit cost of renting land and the implicit cost of owned land in the form of its rental value.

(iii) Classification based on variability: Based on variability, farm costs can be subdivided into variable costs and fixed costs. Variable costs vary with production, and are largely expressed as explicit expenses such as seed and fertilizer costs, and labour

costs. Fixed costs do not vary with output, including depreciation and land rent and often implicit costs. This classification helps in production planning and cost control.

3. Classification by Function

The classification of a function is done according to its use. Costs on the farm can also be broken down into direct and indirect costs, depending on the purpose. Direct costs are the costs which are directly related to production such as labour cost, input cost etc. are mostly explicit. Indirect costs (or overheads) are costs not directly attributable to the project but are associated with it, such as depreciation, interest and taxes, and can be explicit or implicit.

4. Composition of Farm Cost

(i) Major Components:

Farm cost consists of a number of component parts which are considered together as the total costs of cultivation. Human labour can be explicitly cost and family labour is a cost (not explicit). Use of bullocks and machinery in farm operations is paid using animal and machine labour. A significant component of explicit costs is material inputs like plant protection chemicals, fertilizers and seeds.

Land costs include the rent charged on leased land plus the rental value (an implicit cost) of owned land. The interest on borrowed capital (explicit) plus interest on owned capital (implicit) is considered a capital cost. A non-cash or implicit cost is depreciation on machinery, buildings and implements. Other ancillary costs, such as irrigation charges, electricity and other sundry costs are also components of the total cost structure.

(ii) Economic Interpretation:

Economically, explicit costs are called accounting costs and total economic costs are the sum of explicit costs and implicit costs. Accounting profit is total revenue minus explicit costs, while economic profit is total revenue minus explicit costs AND implicit costs. This distinction needs to be taken into account when a farm business is being evaluated for its actual viability and sustainability (Dillon & Hardaker, 1993).

PROBLEMS FACED BY THE FARM

There are many problems faced by the farm. Here there are some examples.

(a) Problems of Measurement of Farm Costs: The measurement of farm cost is a difficult and complex process because the agricultural production process is unique and involves biological, economic and environmental factors. The classification and the composition of farm costs is not a simple task to be performed accurately, and reliable data, correct resource valuation and allocation procedures are not always available. When data collection and record-keeping are not working well, the results will be misleading. A lack of reliable and systematic data is one of the basic problems in measuring farm cost. Farmers, especially small farmers, have a weak record keeping system with respect to input, labour and costs. Thus, approximate or memory estimates are often used for cost estimation rather than an accurate accounting. This causes errors in cost and classification of costs, and decreases the reliability of farm income analysis (Agriculture Institute, 2025).

(b) Unbalance the adjustments between the various sectors: An important problem is the estimation of the implicit costs like family labour, land owned by the family, and capital owned by the family. The value assigned to these resources is not a price and thus involves assumptions of market values or opportunity costs. Such estimates are sometimes subjective and can be quite different depending on the methodology employed, resulting in different measurement of costs (Food and Agriculture Organization, 2016).

(c) Cost Classification problems (A, B, C Concepts): The categories of farm cost (Cost A, Cost B and Cost C) contain explicit and implicit components. But it's not always easy to tell these apart. In mixed farming, it could be difficult to determine the division of paid-out costs and imputed costs or to differentiate fixed and variable costs. It is a frequent cause of double or wrong classification of cost components, which has an impact on policy analysis and price setting.

(d) Allocation of Joint and Overhead Costs is difficult: Many resources are shared across a number of enterprises in agriculture, e.g. machine and labour for several enterprises, and land for both livestock and arable farming. It is very difficult to apportion these common costs among crops or activities. Farmers tend to apply the methods of proportional allocation rather than scientific methods which affect the true cost of production and the profitability of farm enterprises (Agriculture Institute, 2025). This involves both variations and uncertainties in agricultural production. However, agriculture is always unpredictable because of changes in weather, attacks by pests and price fluctuations. These uncertainties extend to input use and to output levels as well and make it hard to measure costs accurately. Cost estimates can vary greatly from those that are experienced at harvest time, and the composition of costs may vary as well (Agriculture Institute, 2025).

(e) Depreciation and Asset Valuation problems: Another major difficulty is the estimation of the depreciation of farm assets like machinery, buildings and equipment. Various methods of depreciation (straight-line, declining balance, or economic depreciation) will give different results. Likewise, subjective valuation of partially used or used assets can influence the level of accuracy of the fixed costs estimation (Food and Agriculture Organization, 2016).

(f) Farming is a subsistence occupation: Farming in many developing areas is a partially or fully subsistence enterprise. In such cases, outputs are used within the household and not sold in the market. This makes costing

and economic analysis difficult since it is not easy to quantify the inputs or outputs (Dillon & Hardaker, 1993).

(g) No standard method for measurement of costs: Actually, **t**here are no uniform methods to be followed by all farmers or researchers for measuring farm costs. Various types of studies might use various valuation methods, cost concepts or types of accounting. This is not standardised and can make comparison between regions, crops and time difficult and can cause inconclusive policy conclusions.

(h) Long and complex process: Absolute measurement of cost requires that data be gathered on farm inputs, labour and output throughout the production process. It is time-consuming, and needs expertise and resources that many farmers do not possess. Because of this, cost measurement is incomplete or inaccurate (Agriculture Institute, 2025).

(x) The External Factors and Market Imperfections have an influence: The measurement of costs is further complicated by external factors like price fluctuations and policy changes and by imperfect market information. A lack of reliable market prices or cost references is a common problem on farms which can cause farmers to overestimate or underestimate the value of their products and the costs they incur. This is also a major issue in countries with low levels of market information systems in developing countries (FAO, 2016).

(xi) Knowledge and Awareness Gap among Farmers: Another challenge is the farmers' lack of knowledge on scientific cost accounting methods. Many farmers continue to use traditional practices and may not have a complete understanding of the significance of cost classification and composition. This ignorance results in poor farm management and wrong assessment of farm profitability (Agriculture Institute, 2025).

For this reason, measurement of farm cost, especially in terms of classification and composition, is limited by a number of practical and methodological difficulties. Cost estimation is complex due to poor record keeping, the difficulty of valuing implicit costs, allocation problems and production uncertainty. To overcome these problems, better systems of data, standardised methods, and awareness must be established among farmers to enable good and meaningful economic analysis.

SUGGESTIONS AND POLICY IMPLICATIONS

Appropriate measurement of farm cost, through correct classification and composition, is of crucial importance, not only on the farm for decision-making, but also for the design of suitable agricultural policies. Below are some suggestions and policy considerations for the key challenges in cost measurement and how they can be overcome to advance farm productivity, profitability and sustainability.

(i) Strengthening Farm-Level Data Collection Systems:

A key policy challenge is to enhance the quality of farm-level information. The Government of India has already been carrying out cost of cultivation surveys under a comprehensive scheme but with limited coverage and accuracy. Enabling Farmers' Agricultural and Resource Management Platform (FARMAP) and encouraging real-time data recording at the farm level can greatly enhance the accuracy of cost estimation (Government of India, 2022). In addition, farmers could have a simple farm record using Mobile phone application, which would minimize the recall bias and improve the reliability of a cost classification.

(ii) Harmonisation of cost concepts in different regions:

Consistency of cost measurement is crucial and will require the adoption of the same standardized cost concepts, as recommended by the Commission for Agricultural Costs and Prices, such as A2, A2+FL and C2. Currently, there are inconsistencies due to differences in the data collection and valuation methods used across states. There are benefits in having a nationally coherent framework, with training and guidance, which would increase the comparability and the effectiveness of the policies.

It is important that this structured approach used by the CACP (A2) and extended by family labour (A2+FL) and land and capital costs (C2) is applied in research and policy consistently (Agriculture Institute, 2024).

(iii) Better estimation of the opportunity cost of capital:

Policies should be geared towards the creation of more objective approaches to the valuation of implicit costs like family labour and owned land. Examples include NSSO and market data that can be used to create a standardized wage rate and land rental benchmark for a region. This would take away the subjectivity and enhance the economic cost estimation accuracy. Implicit costs have an important role in the comprehensive cost (C2) as well, and it is important to properly value them in order to calculate remunerative prices and to guarantee fair farm income.

The proposed reforms of the MSP Policy are based on comprehensive cost. Proposed reforms in MSP Policy are based on comprehensive cost. The concept of Minimum Support Price (MSP) should incorporate a broader cost concept – not just partial cost concept – over time. At the present time, MSP is mainly based on A2+FL, with C2 as a reference benchmark. Incorporating more C2 into the MSP determination process would provide for a full accounting of all economic costs (and benefits of trade), such as land and capital (OECD, 2025). This reform would improve the profitability of the farms and help to overcome the

concerns related to the underestimation of real production costs.

(iv) Improved methods of allocating joint and overhead costs:

In India joint costs need to be scientifically improved to allocate joint costs since the joint farming is common in the country. Farm Management tools like enterprise budgeting and cost accounting techniques should be encouraged through policies. Extension and agricultural universities can be of great assistance in training farmers in cost allocation methods.

(v) Digital and Precision Agriculture promotion:

The use of digital technologies, such as precision farming tools, can enable better monitoring of the application of input and decrease measurement errors of costs. New technology like GPS to track when inputs are used, IoT sensors and farm management software can provide real time information on labour, irrigation and input usage, and produce a more detailed cost composition analysis.

(vi) resolving market imperfections and input cost distortions:

Policy measures should seek to address the input market distortion, particularly that of fertilizers and water. The CACP has pointed out that the imbalanced fertilizer subsidies cause inefficiency in the use of inputs, excess costs, and pollution. It is possible to rationalize subsidies and better utilization of nutrients in a balanced way to make the use more cost effective and sustainable (CACP, 2024).

(vii) Promoting diversification of crops:

Incorporate cost measurement in policies for crop diversification. The incentives for rice and wheat have led to cost structures and resource use being skewed. Diversification into pulses, oilseeds and value-added crops can lead to more profitable and less ecologically stressful farming (Agriculture Institute, 2024).

(viii) Capacity Building and Farmer Awareness:

It is crucial to improve the awareness of farmers on the concepts and accounting of costs. Training programmes, extension and farmer field schools should aim to inform farmers of cost classification, record keeping and profitability analysis. Improved knowledge will enable farmers to make informed production and investment decisions.

(ix) The integration of Cost Measurement with Sustainability goals:

Going forward, environmental sustainability must be incorporated with cost measurement in future policies. The increased use of inputs has driven up production costs, particularly the cost of fertilizers and water, and has negatively affected natural resources. The inclusion of environmental costs in a farm cost analysis can inspire sustainable agriculture practices, and hence sustainable productivity in the long-term (OECD, 2025).

(x) Enhancing institutional arrangements:

It is necessary to beef-up the institutions that conduct cost estimation, such as the CACP, NSSO and Directorate of Economics and Statistics. Greater coordination between these institutions, as well as better information-sharing tools, can help generate better cost estimates and timelier information a key element in policy development.

LIMITATIONS OF THE STUDY

The study has certain limitations, which are discussed below:

1. All the data used in the study are secondary data gathered from the available published materials like NSSO reports, CACP publications, FAO databases and literature; hence, the accuracy of the analysis is dependent on the reliability of the published secondary data.
2. Implicit costs, including family labour, owned land and owned capital, are subject to assumptions and imputations which can differ between studies and regions.
3. The findings may not be representative for the country as a whole because of the diversity of farming systems, agro-climatic conditions, and adoption of technologies in different regions.
4. The study does not deal with detailed primary field level investigations of individual farm households but it is mainly concerned with the classification and composition of farm costs.
5. Limitations in the econometrics, like aggregation of data, errors in measurement and exclusion of some qualitative factors affecting farm cost may affect the economical estimations.
6. Dynamic factors (climate change, market volatility, policy changes, technological change) are introduced in the conceptual level only, and are not quantified in detail.
7. The study focuses primarily on the Indian scenario of agriculture and so may not be entirely relevant to agricultural systems in other countries in which the institutional and economic contexts are different.
8. Mixed farming systems are complex and it is difficult to precisely allocate joint and overhead costs to enterprises which can have a impact on the accuracy of cost composition analysis.

CONCLUSION

The measurement of farm cost in India is a critical aspect in the development of farms, mainly depending on proper classification and composition. Technological, institutional and policy change are needed to overcome the problems of data gaps and methodological inconsistencies and valuation issues.

Overall, India has the potential to improve agricultural development by enhancing the measurement of costs and impacts, as well as linking them with pricing policies, sustainability targets, and the well-being of farmers. Organizations, such as the CACP and NSSO have developed very solid methodologies, but there are still practical problems that result in inaccuracies, such as recall bias, joint cost allocation, and regional variability. Solving these challenges will entail better data systems, better farmer awareness and more standardised methodologies to secure reliable cost estimation and effective policy formulation.

Econometric analysis is also used to gain insight into cost dynamics and allows for identification of cost drivers and economies of scale. But problems with data quality, the value of non-market inputs and regional heterogeneity remain. In the era of increasing input prices and climate risks, the sophistication and precision of the farm cost measurement is crucial to meet the farmer welfare, productivity and sustainable agricultural development goals.

Finally, a strong and broad measurement system for farm costs, based on a clear classification and detailed composition, is essential for sustainable agricultural development, better farm incomes and evidence-based policy formulation in agriculture.

REFERENCES

- Agarwal, P. K., Yadav, P., & Mondal, S. (2018). Economic analysis of cost and return structure of paddy cultivation under traditional and SRI method. *International Journal of Agriculture Sciences*. Retrieved from https://www.researchgate.net/publication/332073216
- Agriculture Institute. (2024). Agricultural pricing and policy challenges. Retrieved from https://agriculture.institute/agricultural-policy/revised-agricultural-prices-commission-mandate
- Agriculture Institute. (2024). Cost concepts and MSP framework in India. Retrieved from https://agriculture.institute/agricultural-policy/formation-role-agricultural-prices-commission-india/
- Agriculture Institute. (2025). Agri cost budgeting and challenges in cost management. Retrieved from https://agriculture.institute/farm-cost-mgt/agri-cost-budget-importance/
- Agriculture Institute. (2025). Common challenges in agricultural value chain analysis. Retrieved from https://agriculture.institute/farm-cost-mgt/common-challenges-value-chain-analysis-agriculture/
- Commission for Agricultural Costs and Prices. (2023). Price policy for agricultural commodities. Government of India.
- Commission for Agricultural Costs and Prices. (2023). Price policy for Kharif crops 2023–24. Government of India. Retrieved from https://cacp.dacnet.nic.in
- Commission for Agricultural Costs and Prices (CACP). (2023). Price policy reports. Government of India. Retrieved from https://cacp.dacnet.nic.in
- Delincé, J., Ciaian, P., Gomez y Paloma, S., & Ronzon, T. (2014). Literature review on cost of production methodologies. European Commission. Retrieved from https://www.researchgate.net/publication/311650033
- Dillon, J. L., & Hardaker, J. B. (1993). *Farm management research for small farmer development*. Food and Agriculture Organization. Retrieved from https://www.fao.org/4/v9926e/v9926e00.htm
- Doll, J. P., & Orazem, F. (1984). *Production economics: Theory with applications*. New York: Wiley.
- Food and Agriculture Organization. (2016). *Farm management guidelines*. Retrieved from https://www.fao.org
- Food and Agriculture Organization. (2016). *Farm management and cost evaluation guidelines*. Retrieved from https://www.fao.org
- Food and Agriculture Organization. (2016). *Handbook on agricultural cost of production statistics*. Rome: FAO. Retrieved from https://www.fao.org/3/i5151e.pdf
- Goswami, R., Chatterjee, S., & Prasad, B. (2014). Farm types and their economic characterization in complex agro-ecosystems. *Agricultural and Food Economics*. Retrieved from https://agrifoodecon.springeropen.com/articles/10.1186/s40100-014-0005-2
- Government of India. (2022). Comprehensive scheme for studying cost of cultivation of principal crops. Directorate of Economics and Statistics. Retrieved from https://desagri.gov.in/en/divisions-cell/cost-studies-cs/
- Gulati, A. (2018). *From plate to plough: Agricultural reforms in India*. ICRIER. Retrieved from https://icrier.org
- Kay, R. D., Edwards, W. M., & Duffy, P. A. (2016). *Farm management* (8th ed.). McGraw-Hill Education.
- Narayanamoorthy, A. (2013). Profitability in crop cultivation in India. *Indian Journal of Agricultural Economics*. Retrieved from https://www.researchgate.net/publication/287784600
- National Sample Survey Office. (2019). Situation assessment of agricultural households and land and livestock holdings (NSS 77th Round). Ministry of Statistics and Programme Implementation. Retrieved from https://mospi.gov.in
- OECD. (2025). *Agricultural policy monitoring and evaluation: India*. Retrieved from https://www.oecd.org/en/publications/2025/10/agricultural-policy-monitoring-and-evaluation-2025_354e7040/full-report/india_a08610a6.html
- Shephard, R. W. (1953). *Cost and production functions*. Princeton University Press.
- Varian, H. R. (1992). *Microeconomic analysis*. New York: W.W. Norton.

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