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SUBJECTS

1. Problems in Calculating Cost of Cultivation.

2. Objects and Methods of Crop Planning.

3. India's Foreign Trade in Agricultural Commodities.

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CONTENTS.

PREFACE

This issue of the Journal is a record of the proceedings of the Twelfth Annual Conference of the Society held in November 1951, at Gwalior, Madhya Bharat. In addition to the delegates from the Universities, the Central and State Governments sent their representatives to the Conference. The papers read at the Conference were of a high quality and the presence in the gathering of educationists, research students and persons who had a live contact with the problems of our agricultural economy, either as administrators or policy makers, contributed much to the level of discussions.

I had observed in my preface to the Lucknow Conference Number (1950) that the reason for the growing interest in our Annual Conference is mainly the selection of subjects for discussion, which have not merely theoretical and academic value but also have a practical bearing on some of the vital problems that affect our present agricultural economy. Our Papers are usually based on field studies. The subjects discussed viz. "Calculation of Costs of Cultivation", "Crop Planning" and "Foreign Trade in Agricultural Commodities" have all an immediate relevance in their practical application to any plan of integrated agricutural development in the country.

We are endeavouring to prepare a comprehensive note on the problem of calculating cost of cultivation in Agriculture based on the Papers submitted at the Conference and the discussion which followed. This note is expected to be ready within a month and we shall circulate the same to members.

We wish to take this opportunity of thanking the Government of Madhya Bharat, who acted as the hosts of the Conference and who by their excellant arrangements made it a complete success. We must particularly express our grateful thanks to H. H. the Maharaja of Gwalior, the Raj Pramukh, Shri Takhtamal Jain, the Chief Minister of Madhya Bharat, Shri K. B. Lall, the Chief Secretary of the State, Dr. L. C. Jain, the Economic Adviser and Development Commissioner, Madhya Bharat, and the members of the Reception Committee for their generous hospitality.

MANILAL B. NANAVATI
President.

Bombay, 15th February 1952.

not touched even the fringe of the problem.   An integrated programme of crop planning for the country as recommended by the Planning Commission must be based on a scientific study of cost of cultivation.   Such a study will also help in the fixation of fair prices for agricultural produce and will be of use in calculating the levy for agricultural income tax. From the statistics of cost of cultivation, it will also be possible to assess labour productivity in agriculture as in industry and to prepare an index of agricultural labour productivity for the State.   The scheme proposed is only in the nature of an exploratory survey as preliminary to a detailed survey based on cost accounting method when finances are available.   No doubt there are administrative, financial, technical and psychological problems to be faced in connection with cost of cultivation studies.   But the task is worthwhile and should be organised on an All-India basis.

METHODOLOGICAL PROBLEMS IN AGRICULTURAL COST ACCOUNTING

by

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I.   *Aims.*

It is very significant that just following "contents" in a bulletin entitled *"Cost of Producing Milk in Pennsylvania"*[1] there is a paragraph which reads as follows:—

"The costs of producing as determined in this study are not necessarily the costs which must be returned to farmers in order to bring forth a supply of milk sufficient to meet the demands of the market.   No claim is made that they represent such costs.   There are periods when, due to no other alternative opportunities for the use of their labour and capital at other farm enterprises or work off their farm, farmers will continue to produce milk for less than costs of production as determined by studies of their nature.   There are also periods when the price necessary to bring forth production to meet market demands must be greater than such costs. The costs presented in this publication are simply the costs as determined according to the accounting methods explained in this bulletin."

The apologetic attitude expressed above has also to be assumed even today by all students of agricultural cost accounting.   It does not mean that no more advances in the field can or will be made in the future.   It only shows the grave limitations of most of the agricultural cost accounting studies.

One of the important aims of cost accounting studies is to arrive at data explaining cost structure with a view to price fixation.   The serious problem of high prices for the consumer on one side and relatively low production by the agricultural producer on the other has raised a difficult question as to whether higher prices, if manipulated by the State, is a sufficient incentive in the long run for increased production.   I believe when the lay public wants economists to study cost-structure, they implicitly mean that we should answer the previously stated question.[2]

    1 Barr, W. L. *"Cost of Producing Milk in Pennsylvania."*   The Penn. State College Bulletin No. 467. August, 1944.
    2 Desai and Madiman ; "Cost of producing Milk in Anand Area." *Indian Journal of Agricultural Economics.* August, 1951.

Another important aim of cost accounting studies is to arrive at levels of optimum combinations of factors of production. It is generally accepted that a detailed cost study could easily facilitate the work of extension-agents in advising the reconstitution of enterprises by the farmers. Dr. P. C. Patil had virtually this in mind while working on the cost-studies, which were subsequently published by him. In an article by the present author and his colleague, published in the August issue of this Journal,[3] it is evident that with proper use of feeds, costs of milk production could be considerably reduced.

II.   *Factors affecting costs.*

(i)   The difficulty in arriving at some definite figures about "costs" lies not so much in such problems as fixing the wages for family labour, etc., as in arriving at a particular level through a virtual maze of variations wherein the costs vary not necessarily in a normal curve relationship.

For example, in the attempt at estimating the cost of milk production in Anand, the following relationship was evident.

TABLE NO. 1.

Total Amount of Milk Produced in lbs. (3 months)	Cumulative total of milk Produced in lbs. (3 months)		Cost of producing 1 lb. of milk. Rs.			Cumulative Average of cost of producing 1 lb. of milk.		
1804	1804	(11.2)*	0	3	8	0	3	8
1164	2968	(18.5)	0	3	11	0	3	9
1279	4247	(26.5)	0	4	0	0	3	10
673	4920	(30.7)	0	4	2	0	3	10
1509	6429	(40.1)	0	4	3	0	3	11
301	6730	(42.0)	0	4	3	0	4	0
1195	7925	(49.4)	0	4	10	0	4	1
820	8745	(54.6)	0	4	10	0	4	2
1418	10163	(63.4)	0	5	4	0	4	4
1205	11368	(71.0)	0	5	6	0	4	5
671	12039	(75.1)	0	6	1	0	4	6
1259	13298	(83.0)	0	6	3	0	4	8
921	14219	(88.8)	0	6	3	0	4	9
863	15082	(94.1)	0	6	3	0	4	11
929	16011	(100.0)	0	7	3	0	5	0

*Figures in brackets show the cumulative total as % of the total milk produced.

The Table No. 1. shows that the variation between the costs incurred is all the way from Rs. 0-3-8 per lb. of milk to Rs. 0-7-3 per lb. of milk. If we *assume* that the farmer incurring the maximum cost is the least efficient one, then the marginal cost of producing milk is Rs. 0-7-3 per lb. as against the cost of Rs. 0-3-8 per lb. as incurred by the most efficient farmer. That this assumption is not necessarily justified will be seen later.

The problem is, therefore, how to pass a judgment that the cost of producing one pound of milk is about 'x' number of annas. Hence, the need for choosing between average, representative and marginal costs becomes evident. Before coming to any final conclusion on this point, it will be worthwhile understanding the factors that affect the cost-structure.

3   *Ibid,*

(ii)   Factors affecting costs may be broadly classified into four major categories viz.   (a) natural and uncontrollable in the short run, (b) management problems which are controllable in the short run, (c) economic relationship which are controllable only in the long run, and (d) natural and uncontrollable even in the long run.

(a)   Under this category viz., natural and uncontrollable in the short run, factors like quality of buffaloes, susceptibility of land to management and some effects of seasonal and climatic variation may be placed.   All these factors are *within limitations* subject to changes with the development of science and technology.   They directly affect the productivity and hence affect the cost structure.

(b)   On the other hand, efficiency of the entrepreneur, ability of and facilities for the farmer in arriving at optimum input and output ratios are easily controllable in the short run.   The whole cost structure could visibly be changed by efficient extension agencies in relatively short time It, therefore, means that these 3 factors will have to be taken into consideration while concluding as to which of the three methods viz. average, marginal or representative costs has to be followed.

(c)   Economic relationships comprising of the institutions of sub-division and of fragmentation, the ability of the society to control the use of land as well as the class structure, though controllable only in the long run, have a definite effect on the cost structure.   Why the class structure cannot be neglected will be further discussed at a later stage.

(d)   Natural and uncontrollable factors like the rainfall, fertility of the soil and a host of other factors affect the cost structure.   It is quite possible that in many cases due to such uncontrollable factors even a most efficient farmer will have to incur heavy costs to produce a particular commodity and thus may be rated by some as a marginal farmer.

III.   *Marginal Costs vs. Average Costs.*

Most cost accounting studies aim at facilitating price fixation in the short run (say for an year or two).   The price for any commodity that is recommended must be such that it not only should be sufficiently remunerative to the farmer but also that it should act as an incentive to increased production of that commodity.   Again, the recommended price should not only be out of gear with the whole economy but also that it should not be at the same time too taxing on the lay consumer.

If, therefore, in the case of Anand cost-study (see table No. 1), it was assumed that the marginal farmer's production of 929 lbs. is essential for meeting the demands of the market and then it is recommended that price of milk be fixed at Rs. 0-7-3 per lb. it would mean a doubling of price level and it would be impracticable.   But this is virtually what, I presume, is recommended by Biswas in his article.[4]

(i)   The thesis presented by Biswas in his article may be briefly stated as follows:—

After making two basic assumptions that "Agriculture in an old country like India is definitely a diminishing return industry[5] and that "the automatic process of adjustment of supply to demand" . . . . "brings . . . about a cost-price parity" . . . he concludes that the . . . "technique of marginal analysis is the appropriate analytical device that can be logically adopted in calculation of agricultural costs in India".

4   Biswas, C.D.; "Agricultural Cost: A Study" *Modern Review*, Jan. 1945, p. 29.
5   Ibid p. 32 Its methodological Approach.

He further states . . . "Of the three types of cost, the average, the representative, and the marginal, as a basis for price fixing, the last is theoretically the most sound, though difficult for calculation. The average cost is definitely unsound in an increasing cost industry, though its calculation is quite easy.   The representative cost is the via-media; it is the average cost of the farms belonging to the largest frequency (model) group."[6]

He then tries to further elucidate the relationship between supply price and the present inflationary forces in India and concludes that " . . . against the marginal cost principle it may be contended, in the present context of inflationary spiral, that in theoretical consideration of the logical basis of cost-price parity, the essential object of price-fixing should not be missed or relegated to the background.   The purpose of price fixing is not merely to stabilise price at a suitable level but also to bring relief to the consumer by reducing the price level.   The contention can be very easily met.   All things being equal, the price cannot fall below the cost of least efficient farmer, because in that case he will be ousted and the more efficient producers will curtail production.   As a result the demand will go unsatiated with consequent rise in price.   So, there is no way out but to relate price to the marginal cost i.e. the cost of the least efficient farmer."

(ii)   If the assumptions he makes are held to be valid, then all have perforce to agree with his conclusions.   But many may be tempted to disagree with him in his basic assumptions.

Is agriculture really a diminishing return industry?   Does it mean that with further intensification the cost of production will always be rising?   On this point, he states that he is referring to the short run period.   Even assuming that new innovations and improved techniques can be put to use only in the long run, it seems that proper farm-management can definitely reduce the costs.   In the example previously cited, it was found that there was significant corelationship between the feed ratios (quantity of feed required to produce 100 lbs. of milk) and the costs as incurred by different farmers.   It only means that even in the short run, given proper guidance, costs can definitely be reduced.   There is no reason why this should not be true even in the crop-production enterprise.   In other words, Biswas is underestimating the role of farm-management in reducing costs.

The second point, on which many will question Biswas's thesis, is that he implicitly follows the Marshallian approach of marginal analysis. His contention that unless price is fixed at marginal cost level the demand will not be met and that the least efficient farmer will be driven out and that the efficient producers will curtail production can only be held valid if the Marshallian approach is followed.   It has been quoted in the beginning of this article that even in the U.S.A. where agriculture is highly commercialised, it is quite possible that in the absence of alternative opportunities it is very difficult, if not impossible, to curtail production in agricultural enterprises even if the price is low.   In a country like India, where there is excessive pressure of population on land and where agriculture is also a way of life, fears about curtailment of agricultural production seem a little unfounded.   It is true that in case of food *vs.* money crops this process may be observed to some extent, but that alone does not justify the use of Marshallian approach in cost-studies.

6   Ibid p. 33.

The example of money crops gaining over the food crops cannot be used for justifying the universal use of Marshallian approach for the following reasons.

(1)　Such alternatives do not exist over more than 30 per cent of the agricultural area in India.

(2)　Secondly, with most holdings of very small size, smaller tenants and poorer owner cultivators are not in a position to exercise this right to choose due to their inability to get even two square meals a day.

(3)　Thirdly, the problem of food *versus* cash crops is a problem to be found within the crop-cultivation-enterprise. In Marshallian approach the costs are held to be those for an individual enterprise as a whole. The efficiency or otherwise is always understood in relation to the whole enterprise.

(4)　That increased prices will bring forth increased production is generally accepted. But this conclusion does in no way prove that "the marginal cost is the *only* (underlining is mine) logical basis for price cost parity". Biswas's basic contention is that the average cost will be less than the marginal cost; and, that if the price is fixed on average-cost-basis the market will have to go without the essential output of the least efficient farmer. The question, therefore, is whether the farmer, whom Biswas calls least efficient, can increase his efficiency in the short run and thus reduce costs. If the State, through extension service help the farmer in reducing costs, there seems to be no reason why, the State should be asked to fix the price level at marginal cost in preference to average costs, and make the consumer pay through his nose. The hypothesis that the least efficient farmer of Biswas cannot increase his efficiency in the short run makes him logically conclude that marginal cost approach is the correct one. If the hypothesis is questioned then his conclusion will also be held invalid.

Statistical Analysis and Cost-Studies:

Selection of cases for cost studies on a random basis is also generally advocated by some. It is, therefore, not surprising to find in a cost-accounting study that the farmers are selected at random. To examine if this method of collection is really a valid one, it is necessary to examine the data given in Table No. II.

Data collected during the reconnaissance Survey of village Lambvel carried out in connection with the project for estimation of cost of milk production.

TABLE NO. II.

Class.	No. of families.	No. of families as % of the total.	Average area cultivated per head in each class acres	Daily total milk production as achieved by each class lbs.	Average milk produced per buffalo owned by respective class lbs.
Landlord..	17 (4.8)	4.8	4.0	12 (2)	2.4
Capitalist Peasant ..	46 (12.0)	12.9	12.0	301 (36)	4.1
Average Peasant ..	126 (35.4)	35.4	3.9	44 (44)	3.0
Tenant	48 (13.4)	13.4	2.3	13 (13)	2.4
Labourer....	119 (33.4)	33.4	....	5 (5)	1.8
Total ..	(100.0)			(100)	

In a village like Lambvel, if sampling was done family-wise, then chance for selection of families of labourer in the population is one in three; on the other hand that for the capitalist family to be selected is 1 in 8. Now the labourer-class produces only 5% of the total village milk while the capitalist-farmer class produces 36% of the total village milk. The significant point is that these two classes produce milk at relatively different efficiency as can be seen from Table No. II. Hence, if the cases are selected on the basis of family undue weightage is likely be given to the less efficient labourer-class to the neglect of more efficient capitalist class.

Such a randum-selection will no doubt give the impression that the representative costs as conceived by Biswas are higher than the average costs. But if stratified random sampling is resorted to, there seems to be a great chance of representative costs nearing the average costs. The exact basis for stratification will however have to be decided in each research project as no universal rules could possibly be made in such a type of study. For, in quite a number of cases higher production need not lead us to conclude that it is also efficient production. In fact, in many cases it is just possible that higher production per unit may be achieved at the cost of efficiency.

On the whole, however, there seems to be a great need for a clearer understanding of the input-output relationship productivity and efficiency levels, by the students of agricultural costs.

Conclusions:

(1) It is evident from previous discussion, that, in view of the improper developments in methodological approaches as far as cost-accounting-studies are cooncerned, the students of economics are not as yet in a position to come to any precise conclusion as to the optimum price levels for any commodity. This however does not imply that a value judgement as to the need for a relative increase or decrease in price of any commodity, by economists is not in line with scientific conclusions.

(2) There seems to be an urgent need for the student of Indian Economics to give more attention to the methodological approaches in cost-accounting studies. Prof. Biswas has done a great service by writing and publishing his thought-provoking article on Methodology.

(3) For evelution of alternative approaches (like Marginal cost approach and average cost approach etc.) more data than available at present is essential. As at present, only the relative merits and demerits could possibly be studied without coming to any conclusive evidence.

(4) Formal random sampling methods in selection of cases for cost accounting studies do not appear to show much promise. A carefully planned stratified-random-sampling method seems to be more desirable.

(5) Due to the fact that no clear cut methodology for cost estimation could possibly be agreed upon at this juncture and also due to the prevailing inflationary conditions, it would be worthwhile taking average cost level as the one where prices could reasonably be adjusted. If prices fixed around average cost level coupled with necessary changes in the farm management techniques and in the institutional frame-work do not afford sufficient incentive for increased production, only then the need for considering seriously the marginal analysis technique arises.