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SEMINAR SERIES - XI

**Seminar on**  
**DEMAND AND SUPPLY**  
**PROJECTIONS FOR**  
**AGRICULTURAL**  
**COMMODITIES**

GIANNINI FOUNDATION OF  
AGRICULTURAL ECONOMICS

*WITHDRAWN*  
OCT 26 1970



**THE INDIAN SOCIETY OF AGRICULTURAL**  
**ECONOMICS, BOMBAY**

Seminar on  
DEMAND AND SUPPLY  
PROJECTIONS  
FOR AGRICULTURAL  
COMMODITIES



THE INDIAN SOCIETY OF AGRICULTURAL ECONOMICS  
46-48, Esplanade Mansions, Mahatma Gandhi Road,  
Fort, Bombay-1.

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DECEMBER, 1972

Price : Rs. 10.00

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Mimeographed and published by Shri T. R. Sundaram for the Owners, The Indian Society of Agricultural Economics, at 46-48, Esplanade Mansions, Mahatma Gandhi Road, Fort, Bombay-1 (India).



PART II

PROCEEDINGS OF THE SEMINAR

## PROCEEDINGS OF THE SEMINAR

The Chairman opened the discussions with the remark that agricultural projections for the supply and demand be based on the behaviour of the production unit, namely, the farms. Therefore, delineation of the State into type-of-farming-areas was a pre-requisite before any aggregation was made at the State or national level. Similarly, the input-output co-efficients also might change with a breakthrough in technology from time to time; so also the changes in the price elasticity which were used for demand projections.

The Group felt that discussions may be initiated on supply projections, it being a more difficult area. The merits of different approaches used in this analysis, such as yardstick approach, production potential approach, material balance approach, production function approach and programming approach, etc., may be assessed.

Yardstick approach had been used by the National Council of Applied Economic Research and several Government agencies. It was a crude but simple method and was used even today. Since better information and refinements in terms of accurate statistics of area, yield, input-output relationships for each input as well as for the package of inputs were now available, there was an improvement over the early guess work of experienced persons. Intelligent estimates based on more adequate data and analytical methods were being made. However, many difficulties remained still unsolved, because while the response of yield to factor input was

different in different regions, such yardsticks for different regions were not separately available. The smaller the region the greater the uniformity of response. The Group felt that more relevant composite coefficients should be developed to get better estimates of supply response and projections.

A question was raised: given a type-of-farming area, was it possible to make a linear projection in view of uncertainties of technology and yield variability from one year to another? It was suggested that yield variability could be taken care of by using three years' moving average or by taking the standard deviation of yield. Emphasis was then laid on a modified form of the Nerlovian model. It was contended that the farmers' response depended not only on the expected prices but also on the expected variability in prices. However, it was pointed out that production response depended not only on price variability but also on the nature of the crop and its substitutability in production, etc.

Production function approach to supply projections was then discussed in estimating the growth and changes in the rate of growth with the 't' as the base. However, it was pointed out that there were problems of multicollinearity to overcome. Regression models were considered for use in projections but their limitation was inflexibility due to structural changes causing supply and demand shifts. It was pointed out that supply projections required projections of inputs separately. It was further added that unless these projections were used for manipulating supply of inputs in terms of Government policy and planning, it had little meaning.

The yardstick approach to supply and demand projections at the macro level was discussed. The problem posed was, what should be the nature of supply and demand for agricultural products in order to achieve the target of 5 per cent rate of growth in agriculture and 5.5 percent annual increase in National Income. Increase in the area under cereals would be only marginal whereas a definite shift in acreage under pulses and other commercial crops was bound to come, as their income elasticities of demand were relatively high. However, the assumptions of production function involving high-yielding cereals all over the country, constant price structure and low technology in non-cereal production, etc., needed further examination. In view of the uncertain and uneven level of technology used, it was suggested that short-term projections would be more meaningful than long-term projections. It was suggested that a programming model specifying the different possibilities and the constraints might be more useful than the simplified model based on mere assumptions. It was felt that a regression model was relatively more successful for projections of demand and consumption as they did not change rapidly and the time series data could be used for the same. But it was not so for supply projections as ingredients of technology were unpredictable.

The problem of aggregation for supply and demand projections was also discussed. In this context, a dynamic behavioural model was outlined. In this, the acreage response was taken as function of price expectations and their variability. It was suggested that the price expectations and uncertainties of competing crops may also be incorporated as variables in the model and analysis made with and without including the time variable.



Linear programming technique as used by the Department of Economics and Sociology, Punjab Agricultural University was also discussed as an alternative method for projecting supply at the macro level. It was suggested that price variable programming could be incorporated to take care of changing price situations. However, a question was raised whether or not such models dealt with allocation problem only and not with the process of development. It was pointed out that the allocation programme took care of the growth process also, as it has the capacity to provide with alternative programmes under different resource complexes to achieve the specified developmental goals. The programme could be designed as a "radar matrix" to show the implications of change in resource constraints and input-output coefficients, as a result of changes in technology, prices or other policy elements.

It was pointed out that for prediction in the short period, regression model seemed to be adequate. However, linear programming model seemed better for longer periods because it could incorporate structural changes.

The use of recursive programming for predictive purposes was also outlined. The advantage of this approach was that it tried to project the decision making process subject to the limits provided by flexibility coefficients and capacity constraints.

The Group suggested that to make further improvement on estimates and projections of supply, more reliable data — time-series and cross-sectional — on inputs and outputs, types of farms and farming areas, etc., need to be generated on systematic basis.

In the last session emphasis was laid on estimation of potentials of production and of supply. In India,

though we are not concerned at present with the problem of oversupply, our interest still lies in the area of potential production and supply. It would be helpful to know what our goals are with respect to supply, how far we could go, what should be the policy mechanism to achieve the desired objective and what variables could be manipulated for the purpose. This brought the Group to the question of approaches to the estimation of potential production and the choice of appropriate set of tools for the purpose.

It was suggested that the whole country could be divided into homogeneous agricultural regions and production potential for these different regions determined separately depending on the available data and the computation facilities. Most projections would, of course, be simple static analysis. A need to build some national models for the purpose was duly recognized. Several sub-models such as those related to water resources, water distribution, weather, etc., were also mentioned. It was felt that in order to develop a national project on estimation of demand and supply projections in agriculture, it was essential that basic work was done both at the State and at the national level. It was pointed out that a small committee was working on the preparation of an all-India co-ordinated project on the Long Range Agricultural Adjustment Analysis to be financed by the Indian Council of Agricultural Research. Mention was also made of the possibility of developing a project on production potential at the national level. Not only the production potential should be the focus of attention, research was also needed on long run policy and the instruments to be used to achieve the policy objectives.

In this context, the importance of subsidies and taxes in respect of agricultural inputs was also underlined. Thus, broadly, the tools could be divided into: (a) those related to the estimation of the production potential and (b) those related to policy mechanism.

A suggestion was made that we should not be so much concerned at the moment with demand, because in the initial stages when basic minimum requirements had to be met, demand estimation might be relatively easy. However, it was argued that, while a study of production technology and potentials was essential, the experience in some other countries such as Thailand had shown that demand was no less important a factor. Water melon was cited as an illustration which did not succeed in Thailand, not because it did not have production potential but because of the lack of effective demand.

On the nature and the kind of models, it was observed that no doubt the most logical and most detailed models were good, yet looking at the availability of data and the computation facilities we might as well make a start with simpler models. Some participants suggested the testing of various models suggested at the Seminar for their suitability to different sets of circumstances.

It was pointed out that we could not afford to overlook the data aspect. Due emphasis should be laid on the type of information required, the type of information available, and the sources of such data, where to get it, etc. The desirability of using the resources of all the agencies concerned with data collection was recognized. A particular mention was made of schemes at the all-India level (All-India Co-ordinated Projects) in respect of different crops. These schemes could provide

the basic data which could prove extremely valuable for economic analysis.

The question of production potential brought in its wake some problems of complementarity of inputs. It was pointed out that in the case of rice, we may have technology but may still not be able to realize the production potential because of problems like that of drainage.

The Group recognised that the demand and supply projections could not be studied in isolation. Related programmes such as storage, marketing, buffer stocks, zonal system, etc., which have a bearing on the farmer's behaviour and, therefore, on these projections, should be studied side by side. It was emphasized that a balance needs to be struck between the logic and the structure of the models.