

PRINCIPLES AND PROBLEMS OF AGRICULTURAL PRICE DETERMINATION

BY PROF. M.L. DANTWALA

This Annual Conference of the Agricultural Statistical Society is meeting under the shadow of an unusual drought, which has drastically slashed agricultural production this year. Even a casual look at the meteorological map reveals that this is perhaps the worst weather year during the last 25 years. Even otherwise, the growth of agricultural production during the last decade has been far from satisfactory; and this has cast something like a gloom over the Indian economic scene. But, as they say, every cloud has a silver lining. The serious challenge posed by the agricultural situation in the country has kindled a new awakening in our thought and action. The scientists, the technicians, the administrators and the politicians are all re-checking their diagnosis and searching for more effective remedies. What is really significant is that the new ideas whether they be in the field of agricultural technology or agricultural institutions are becoming operational. Altogether there are fewer inhibitions, less hesitation in discarding old beliefs, a new respect for science and technology and more confidence in the organisational machinery. It would perhaps not be an exaggeration to say that we are on a threshold of an agricultural revolution. This agricultural revolution will impinge on many disciplines. Agricultural scientists with their many specialisations in plant breeding, plant protection, soil chemistry etc., agricultural economists and statisticians, rural sociologists, organisational personnel and administrators, each will have to play a critical role in ushering this revolution.

Though there is still a lurking belief that agriculture in India is a way of life, nobody seriously holds that it is immune from even the simple laws of economics. If so, agricultural economists and statisticians have to share with other scientists the responsibility of assisting in the process of agricultural development. It is felt that one of the factors relevant to this process is the level and structure of agricultural prices. Early this year, the Government, therefore,

Address delivered at the 19th Annual conference of the Indian Society of Agricultural Statisticians at Cuttack, on 30th December, 1965.

appointed the Agricultural Price Commission to advise on agricultural price policy and price structure in the context of the need to raise agricultural production and give relief to the consumer. One of its major terms of reference was to evolve a balanced and integrated price structure in the perspective of the overall needs of the economy and with due regard to the interests of the producer and the consumer. For the last one year, I have had the opportunity, in collaboration with my colleagues in the Commission and its research staff, to grapple with the real world of the working economy. I thought that I may take this opportunity to share with my professional colleagues the brief experience of this sojourn into the realm of economic administration. This experience has indeed been quite rich and varied. On the present occasion, however, I shall relate only that part of the experience which may be of some interest professionally.

At the very outset the Commission had to make sure what exactly was meant by the phrase "balanced and integrated price structure" mentioned in its terms of reference. Although the phrase has been used frequently in economic discussion in India, I have not come across a wholly satisfactory formulation of the concept of balance and integration, in terms which would be operationally meaningful.

It would be helpful to differentiate between the definitional aspect and the estimational problems relating to the concept. The concept can perhaps be split up into two components: (a) balance and (b) integration. One type of *balancing* could be between the interest of the producer and that of the consumer, though how much of economics would be relevant to the determination of the balancing point is a moot question. As for *integration*, presumably the reference is to the relationship between prices of different agricultural commodities and also between the price aggregate of all cultural commodities and the price aggregate of the products of other sectors.

Several sets of guidelines for deriving such a balanced and integrated pattern can be thought of. It is sometimes suggested that the price structure which prevailed during a reasonably recent historical period considered as 'normal', could form the basis for deriving a "balanced and integrated" price structure. This idea is perhaps rooted in welfare economics, the hypothesis being that the relative income* patterns in the base period were of the right type, economically, socially, and politically; and should, therefore, be maintained. In the

* It is assumed that income levels move with output prices.

dynamic world of today, with the rapidly changing technology of production affecting the cost-return ratios, and the fact that there is a continuous pressure for increased supply levels, reference to a historical normalcy would be wholly inappropriate. Moreover, the fact that demand elasticities with respect to price and income changes vary widely for different commodities, greatly reduces the utility of the past experience. The exercise for evolving the integrated pattern of prices has to be forward looking.

The task of evolving a balanced and integrated price structure, that has been entrusted to the Agricultural Prices Commission, would in a sense require it to anticipate the 'equilibrium' or 'pivot' prices. The equilibrium price structure for the agricultural sector should, inter alia, equate (a) marginal productivities of inputs in agriculture to their prices, (b) demand for factors of production (individually and in aggregate) with their supply, and (c) demand for agricultural commodities (individually and in aggregate) with their supply. The realisation of the first objective, *i.e.*, equality of input productivities with their prices would depend on the degree of mobility of inputs and the existence of full or near-full employment conditions. The second and third criteria, in a sense, are equivalent to a constrained production maximisation model for the agricultural sector, the constraints being the resource availability and the demand targets. If equilibrium prices are anticipated and announced in advance of the production period, the producers may be expected to optimally allocate the resource in a manner that would meet the three criteria specified above. However, the ability of the price fixing authority to correctly anticipate the equilibrium price structure depends on the formulation of the relevant economic model and availability of requisite data.

A number of economic models have been developed and tested by economists. I need not go into the details of their work with which, I am sure, most of you will be familiar. In order to anticipate the 'equilibrium' or 'pivot' prices, the price fixing authority would primarily be interested in models aggregating demand and supply relations for agricultural commodities. The economic function of prices (of outputs and inputs) is no other than that of equating demand and supply with the given resource constraints, technical co-efficients of production and demand and supply elasticities.

While it is possible to conceive of such a model as a theoretical abstraction, there exist a host of difficulties in relating it to real world situations. There are many assumptions on which such a model has

of necessity to be based, *e.g.*, perfect mobility of inputs within the agricultural sector, absence of imperfections in the working of the market mechanism, etc. Even if we ignore these assumptions, it is problematic whether we have reliable information on (1) income and price elasticities of demand for various agricultural commodities and their cross-elasticities, (2) price as well as income elasticities of supply of these commodities, (3) technical co-efficients—current and potential—of production in agriculture and (4) elasticities of demand for and supply of inputs. There is also the problem of aggregation over space, which has brought into a focus the inter-regional variance in resource endowments, quality of inputs and outputs, production technology, consumption patterns etc.

Moreover, in order to envisage the equilibrium price structure, the price fixing authority has to assume the expected level of demand for agricultural commodities. The plan targets may perhaps be taken as adequately reflecting the expected level of demand. Strictly speaking, the magnitude of neither demand nor supply can be taken as given, because both would change with changes in prices. But the formulation of plan targets is based on the assumption that the level and structure of prices will remain unchanged during the Plan period. In estimating demand, its elasticity to price is not taken into account. The estimated equilibrium price structure may not always be the same as that assumed by the Planning authority while working out the demand estimates or production targets. To the extent that the new structure of equilibrium prices is at variance with the price structure initially assumed by the Planning authority, the time paths of targeted demand and supply levels would undergo a change. The magnitude and direction of the difference would depend on the price elasticity of demand and cross-elasticities.

Even if we assume that these problems are somehow overcome, how much faith can be put in the predictive power of the model? In an economy where rapid technological and structural changes are taking place, the parameters of models might change, (even if the model specification remains unchanged), and thereby vitiate the predictive ability of the model. Moreover, in an economy like ours, where the aggregate agricultural production even today is to a large extent dependent on weather, deviations from normal weather conditions may throw the equilibrium price structure out of gear with the ex-post structure of realised prices. If what is said above is generally accepted, can a price advisory authority predict a unique structure of integrated and balanced prices and ensure that it will

stay put during the plan period? Given the present frontiers of our knowledge in this field and the available tools of analysis, the answer, in my view, cannot be a confident affirmative. But, perhaps, there is no need to adopt such a perfectionist stance. It should really suffice if it can specify a range within which the ex-post realised prices might move, and the system can still be 'balanced and integrated'. In fact, as discussed later, operationally also there seems to be no choice but to opt for a range.

This concept of range, therefore, provides a starting point for our price policy. By definition, a range has two points—the lowest and the highest. Even those who implicitly trust the free market mechanism, generally accept the necessity of a minimum support price as well as the desirability of avoiding excessive fluctuations in commodity prices. In developed economies, the genesis of the price policy lies in abnormal situations like the Great Depression or the World War. Where such a policy is continued even during normal times, the main objective is to sustain farm incomes at levels which are considered as socially irreducible. The need to protect minimum farm incomes exists even in developing countries, though at times like the present in India, with prices soaring high, the relevance of such a concern may not be quite apparent. But even in a situation of soaring prices, there may be several pockets where the post harvest prices reach distressingly low levels. A programme under which the Government stands ready to purchase all quantities offered at the minimum support price could, in such a situation, be quite valuable in preventing distress.

It is, however, felt that the objective of the minimum support price policy should not merely be a negative one of protecting incomes at distress levels. The price policy in developing economies should be—as the terms of the reference of the Agricultural Prices Commission emphasise—production oriented and should have an element of incentive in it. This, however, need not necessarily mean a cost-plus price. The incentive element must be tied to the adoption of improved practices. The Agricultural Prices Commission has, therefore, in its Report on Prices of Kharif Cereals, observed that the progressive farmer should be assured that his effort to augment production through the adoption of improved technology will not become unremunerative because of the price factor.

There is the other point in the price range, *i.e.*, the maximum, at which Government's intervention has become necessary because of the continuing and often quite acute pressures of demand for

different agricultural commodities. Safeguarding the interests of consumers has been a very important force behind this policy. It is now an accepted policy of the Government, for example, to maintain a system of public distribution of foodgrains—through fair price shops and informal or formal rationing.

There is, however, one difficulty in the range approach. As already pointed out, the minimum price carries with it a long-term guarantee or assurance of unlimited purchase by the Government. As such, it has to have a certain degree of stability. It would lose its insurance value if the minimum price level is allowed to fluctuate, especially downwards. But fluctuation is the very essence of the price mechanism. Agricultural production varies from year to year and the variations are caused by non-economic factors like the weather. If market prices are not allowed to fluctuate according to variations in production, farm incomes will fluctuate, declining when the crop is small and rising when the production is large. And more than price it is the income that we would like to stabilise. The minimum price—the lower end of the range—can be moved only by reference to the secular (long-term) trend. Its comparative stability will have to be reconciled with the year to year fluctuations of the market price in response to fluctuations in production.

Again, there is the question of the width of the price range. On economic grounds, this would depend on the predictive ability of the model employed. Political and social considerations also sometime become important determinants of the width of the range. Whatever be the approach and the dimension of the range, it is clear that the price policy will have to be related to a price interval rather than a point estimate of price.

Thus, the lack of precise predictive capacity of the equilibrium model as well as the policy requirement of ensuring minimum support and maximum consumer tolerance prices lead to the price range approach. Now the problem is of reconciling the two approaches in the more difficult task of deriving the actual figures of either the pivot price and/or minimum-maximum prices for a given commodity. The criteria for determining the level of minimum (or maximum) prices—which we discuss hereafter—cannot be the same as those which determine the pivot prices, for the simple reason that the economic purposes of these two price concepts are somewhat different.

There are two possible ways in which the equilibrium approach and minimum price approach can be reconciled, for actual price determination. We may first determine the “equilibrium” price

point (which can only be a rough approximation to the ex-post "equilibrium" price) and allow for a certain percentage of off (minus) and on (plus) to determine the minimum and the maximum points in the price range. In the alternative, we may derive the minimum (or the maximum) point and fix the other at a suitable distance, accommodating in between the equilibrium price.

Although the first alternative, *i.e.*, the specification of the minimum and maximum prices in relation to the "equilibrium" or "pivot" price structure is more appealing, at least on the theoretical plane, the problems associated with the anticipation of the "pivot" price structure are many and complex and have already been discussed. As such, we may have to opt for the other alternative of deriving the range from an independently determined minimum price.

This leads us to the search for the criteria which would be appropriate for the determination of the level of minimum prices. This too is not easy and there are as many imponderables as in the search for a model for equilibrium price. It is obvious that the three criteria specified above will have to be taken into account, though not rigidly adhered to in the specification of the structure of minimum prices. The task of the price fixing authority would be not only to suggest price levels for individual crops, but also inter-crop price relationships which would tend to bring about the desired pattern of production. In this context, the cost of production—specially of those farmers who adopt improved technology—and inter-crop price parities become relevant.

It has been suggested that the cost of cultivation should form the basis for the fixation of prices. If, by this, it is meant that price should cover the cost of each and every producer, it is obvious that such an attempt would totally ignore the demand factor in price formation. In a way, price itself has to perform the function of determining the cost. Production takes place within varying degrees of efficiency (levels of cost). Price has to indicate the minimum level of efficiency which the producer has to attain in order to remain in business, especially in the long run. This is obvious in the sphere of industrial production.

Even so, the price advisory authority may not altogether neglect the cost aspect of production. But when it starts looking at the cost aspect, the difficulties of bringing it within a meaningful focus turn out to be quite formidable. Two main questions arise which may be briefly phrased as 'which costs' and 'whose cost'. To a

student of farm management, the question 'which costs' will not appear as unusual. The concepts of cost developed in farm management in India are by now quite familiar.* The main point for consideration is : should the imputed cost of family labour expended on production be included in the cost? Prima facie, there is no reason why it should not be included; for, after all, without the input of family labour, production would not have taken place. Had all that production been obtained through the employment of hired labour, no such question would have been asked. Why then does such a question arise when family labour is used in the production process? It would appear that the question arises firstly because the imputed cost of family labour, viewed from another angle, constitutes the income of the family; and as such, if the principle of fixing prices on the basis of total costs is accepted, we face the paradox of 'higher the cost (of family labour) higher the income' ! This would not perhaps matter if we were sure that at every point in the range of family labour input, its marginal productivity were equal to the wage rate at which the input was evaluated. There is, however, reason to believe that, on small farms in particular, the input of family labour is pushed up to a point where its marginal return is much below the wage rate. This is not surprising. From the point of view of small farmer this is perhaps the most rational use of his labour, and the only available source of adding to his meagre income. He knows that the opportunity cost of his additional labour beyond a point is quite low. In spite of this, if the cost analyst chooses to evaluate the family labour at the going wage rate, it is obvious that the cost of cultivation would get inflated. In view of this, the question really is not whether the imputed value of the family labour input should or should not be included in the cost, but whether the cost of cultivation

*The different cost concepts as used in the Farm Management Studies are given below :

1. Cost A1—Hired human labour, farm and hired bullock labour, seed and manure, both farm grown and purchased, irrigation charges if any, depreciation of agricultural implements and farm buildings; interest on farm loans and miscellaneous other charges as may be involved in the production of crops.
2. Cost A2—Cost A1 plus rent paid on leased in and owned lands.
3. Cost B—Cost A2 plus interest on capital investment in agriculture (including owned and self cultivated land).
4. Cost C—Cost B plus the imputed value of human labour provided by the farming family. Cost C is really the total cost of cultivation.

figure arrived at by valuing at the current wage rate (either of the casual labour or the permanent labour) is a true indicator of the cost or not. It may, therefore, be suggested that while Cost 'C' should be the appropriate cost as a frame of reference for the price fixing authority, the actual figure would need to be discounted because of the limitations of the valuation procedure.

We may now see whether there is any empirical evidence in support of the above reasoning. As you know, we have a fairly large number of farm management surveys. The Agricultural Prices Commission is at present engaged in analysing all the available data from those surveys. The data, no doubt, suffer from many limitations. One methodological limitation is the absence of differentiation in the quality of the inputs. In spite of this, we felt that it should be our endeavour to extract the most from these data, without compromising with the strict requirements of scientific analysis.

Table I, at the end, gives the correlation between the size of the farm and cost of production per maund of paddy and wheat. The correlation of cost 'C' (which includes the value of family labour) with farm size indicates broadly that the cost decreases with the increase in the farm size. A more direct correlation between family labour input per acre and farms size also reveals a high and statistically significant negative relationship (Table II). There is also evidence to show that the return per labour day of family members on small farms is generally lower than that on the big farms. However, whether, and if so to what extent, the cost of production gets inflated by evaluating the farm-family labour on small farms at the going wage rate can be conclusively established only by reference to the marginal productivity (and its relation to the imputed wage rate) of family labour on these farms. Even if the marginal productivity of family labour on these farms is found to be lower than the imputed wage rate, this by itself would not mean that the labour input is inefficiently utilised on small farms in so far as it is used in substitution for other inputs.

The question of 'whose price' is equally complicated. As is well-known, cultivation costs vary from farmer to farmer. What is generally not known is the large range of the variation, both within and between regions. This gives rise to the problem of aggregation of widely varying cost estimates. Taking a random example, we find that in two districts of West Bengal, the cost of production of Aman paddy during 1955-57 varied from less than Rs. 6 a maund

(for the first 10 per cent of production in the least-cost order), to more than Rs. 15/- per maund (for the last 10 per cent of production). Two extreme cost points were, in fact, less than Rs. 3/- per maund and more than Rs. 23/- per maund. Given such a wide scatter, average cost of cultivation will have little operational significance. The average cost in the above case came to Rs. 10.25 per maund. This would not cover the cost of 37 per cent of production, 44 per cent of farms and 38 per cent of area under cultivation. Similar instances can be cited in respect of other crops and regions (See Table III).

So long as these facts are not generally known, the lay opinion would perhaps consider the average cost criterion as reasonable. When, however, these become widely known and discussed, the price fixing authority will be under pressure to fix the price at a level which would cover the cost of the last ounce of foodgrain, however inefficiently produced, under the plea that not only that last ounce but many more are needed to meet the consumer demand. On the other hand, if the economic purpose of price regulation is to stimulate production, the policy should be to ensure that the cost of production of the progressive farmer, who is prepared to adopt/improved technology, is covered through a price guarantee. To bridge the gap between these two polar approaches, it is suggested that the guaranteed price should cover the cost of cultivation of the bulk of the more efficient production. Assuming that 85 per cent of such production is considered as eligible for protection, it may be pointed out that in the case of West Bengal, the bulk line cost will cover the cost of 73.8 per cent of farms and 80.2 per cent of the area under Aman paddy cultivation.

The disparity in the costs of cultivation between different regions is as glaring as that within the region. For example, average cost 'C' for wheat in the Nasik District of Maharashtra during 1954-57 was Rs. 21.3 per maund as against Rs. 11.2 in Uttar Pradesh during the same period. Similarly, the average cost in the second season paddy in Madras was Rs. 7.4 per maund (1956-57) as against Rs. 11.85 for Aus paddy in West Bengal during 1954-57. The variations in the bulk line costs are equally glaring.

It would thus appear that till more refined and accurate cost data become available the price fixing authority will have no alternative but to use its best informed judgment in recommending levels of minimum prices. The Agricultural Prices Commission has already suggested a scheme for obtaining more meaningful cost data.

Another relevant factor in determining the levels of minimum prices is the need to maintain such relationship amongst prices of competing crops as would bring forth the desired levels of their output. As is well-known, the increase in production is obtained either through the increase in acreage and/or increase in productivity through the use of more and better inputs and good husbandry. When increase in production of almost all competing crops is desired, shift in acreage from one crop to another, as a result of the price policy, may not be of much use. But, if shifts are taking place and if a modification in the trend of the shift is desired, price policy can, at best, take some correctional steps. However, if new land is brought under cultivation, the relative prices and profitability will have a definite influence on the cropping pattern of the reclaimed land.

It should, however, be noted that at the micro level where the ultimate decision regarding land use is taken, the farmer will have to contend with constraints of agronomic conditions—soil, rainfall, irrigation etc. as well as those of his resources and skill. The price factor is, therefore, not wholly decisive. More importantly, the extent to which the price impact is retarded by non-price factors cannot be assessed in quantitative terms. Further, whereas the impact of the price factor is general, that of non-price factors is specific to an area. As such, the effect of price factor on production would vary from region to region. This fact of regional variability of the production response considerably reduces the utility of price administration as an instrument for bringing about specific production increases.

Response of inputs other than land would perhaps be more elastic to the product price. But here too in order to bring about the desired shift in the use of, say, fertilisers from sugarcane or cotton to wheat, the price adviser would have to know the precise quantum of increase in the price of wheat that would be needed to enable wheat cultivators to outbid sugarcane or cotton cultivators in the purchase of fertilisers.

For a realistic appraisal of the impact of the shift in the price parity of substitutable crops on production response, we must work only within a regional context, since substitutability between crop varies from region to region. As for the prices, the all-India index number of wholesale prices would be very misleading for studying production responses. Prices of cotton in Punjab may not have

necessarily moved up or down in the same proportion as those of cotton in Maharashtra. With the prevailing disparities in the prices of foodgrains—an unfortunate consequence of the zonal restrictions—the all India index of wholesale prices has lost much of its relevance for the sophisticated analysis of production response to price.

Secondly, with a rapidly changing technology and its impact on input-output ratios, price movements over time may not reflect faithfully the relative changes in profitability of different crops, and in the ultimate analysis it is really the latter which influences the cropping decisions. Speaking of profitability, it would perhaps be necessary to calculate the profitability of the entire crop rotation rather than that of any two single crops. Again, profitability cannot be measured by reference to gross returns only. We have to take into account the changing cost structure as well. But, the various problems associated with cost calculations have already been indicated.

Further, the nature of the price expectation model that the farmer would adopt in taking production decisions has also to be known so that the supply response relations could be specified properly. In most such exercises, previous year's price has been taken to reflect the farmer's expectation. But, it is not certain that the farmer decides his resource allocation pattern on the basis of the average realised price in the year preceding the crop season. It may be that the pre-sowing or the immediate post harvest prices also enter in the farmer's expectation model.

The desirability of conducting production response studies at regional levels, has been emphasised earlier. But, in case the results of the regional studies indicate widely varying regional price structures, the problem of aggregating the regional results for deriving the all-India price structure will remain.

Lastly, it is not enough to know the simple fact that production responds to prices. We would need to know the precise coefficient of response, if the statistically worked out price structure is to yield the targeted structure of agricultural production.

Empirical evidence relating to the impact of changes in price parities of competing crops on their outputs is very limited. Whatever empirical studies have been done, are related to acreage response. Studies on acreage responses to relative price changes have been preferred over the production response alternative on the ground that

while acreage allocation together with allocation of other inputs is quite determinate, production levels are not entirely determined by the farmer in so far as he has no control over that part of the variability in yield which is influenced by weather. One of the difficulties in such studies is the non-availability of relevant price data at the regional levels over a sufficiently long time. Again, there is the problem as to the price estimate (wholesale, farm harvest or net prices received by farmers) that should be used in the production response studies.

Notwithstanding the above limitations, the Agricultural Prices Commission has initiated detailed studies on supply response. So far, results of the data only at the all-India level are available. Though these results are of limited use for deriving the structure of minimum prices, they are indicative of certain broad relations between price relatives and acreage responses. The studies at the all-India level relate to acreage shifts between: (a) groundnut and jowar, (b) groundnut and bajra, (c) groundnut and ragi, (d) groundnut and cotton, (e) cotton and jowar, (f) jute and rice and (g) sugarcane and rice.

The following hypotheses were formulated and tested :-

- (a) acreage allocation decisions for a crop depend upon previous year's realised prices for that crop and also for substitutable crop,
- (b) acreage allocation decisions for a crop depend upon the ratio of previous year's realised prices for the crop to that of a substitutable crop, and
- (c) acreage allocation decisions for a crop depend upon the ratio of previous year's gross returns (price \times yield) for the crop and that of a substitutable crop.

The results of the exercises broadly indicate that the various model specifications (based on the three hypotheses) have yielded varying results for various crops. The statistical test of the first hypothesis relating to the acreage response for groundnut to one year lagged prices of groundnut and cotton show that shift in groundnut acreage are satisfactorily explained by the price changes. The price co-efficients are significant and 39% of the variance in groundnut acreage is explained by the price movements. Reasonably good results have also been obtained on acreage response for sugarcane taking into consideration lagged price of sugarcane and rice. The results are very significant and

nearly 90 per cent of the sugarcane acreage variance is explained by the one year lagged prices of sugarcane and rice. The statistical test of the second hypothesis shows that the groundnut cotton acreage ratio is significantly related to the one year lagged price ratio for the same crops ; 49 per cent of the variance in the acreage ratio is explained by the relevant inter-crop price ratio. The third hypothesis relating acreage ratio to one year lagged gross revenue ratio have yielded over all unsatisfactory results. In the case of other crops which have been studied so far, results are either not statistically significant or they fail to confirm to economic logic.

The above results, based as they are on the all-India data and the rather elementary model specifications, can at best, be taken as indicative of certain directional relations. Much more detailed work is called for to determine the precise nature of the response coefficients.

In spite of all these difficulties in evolving balanced and integrated structure of agricultural prices, a distinct outline of a positive price policy has emerged during the past one year. Firstly, the Government now stands firmly committed to the policy of guaranteeing minimum support price for a large number of agricultural commodities. At this price the Government will buy all quantities offered for sale and thus prevent a further decline in prices. Though the criteria for deriving the level of minimum prices have not yet been firmly evolved, the levels fixed for minimum prices appear, by any token, fairly liberal. When in 1964 the Jha Committee first fixed the minimum prices for paddy, they were about 10 per cent higher than the average harvest prices which prevailed during 1961-64—which was a period of rising prices. The Prices Commission endorsed these with some marginal changes for 1965. I think the categorical acceptance of the principle of minimum support price guarantee by the Government is a positive advance in the evolution of the price policy. The more acute problem during the last few years, however, has been at the other end of the price range ; that of restraining price rise in the interest of the consumer. Here too a positive policy has emerged, particularly in regard to foodgrains and a few other food articles (sugar, edible oils etc.). The Government has accepted the responsibility of maintaining a system of public distribution of foodgrains—through fair price shops, informal or formal rationing and thereby taking care of a certain percentage of consumer demand. In 1965, for example, 8.12 million tonnes of foodgrains (5.76 of wheat and 2.26 of rice) would be made available

through the system of public distribution. There can be no doubt that this did help to check the rise in prices ; at any rate, the recipients of this quantity were able to secure their requirements at reasonable prices. Over and above this, statutory maximum prices are declared for certain crops in several States; but as we know the enforcement of the ceiling limits has not been quite successful. One economic device by which a public authority can keep the price within the ceiling limits is to release sufficient stocks at the appropriate time. Till a system of public procurement is perfected or there is a possibility of obtaining imports in required quantities, the stocks for such an operation would not be adequate.

Thus, though the range approach has now been accepted, the fixation of the minimum and the maximum points of the range is still made on an *ad hoc* basis. It should now be our effort to progressively impart a more scientific basis to the determination of the lower and the upper points of the range.

Friends, I have traversed over a wide range of topics and that too haltingly and with much diffidence. I would request you to treat what I have said as a process of thinking aloud, sharing my thoughts with you. I believe it is the responsibility of our entire profession to make a constructive contribution to agricultural price policy. What has been done hitherto is no more than clearing the decks. Let the whole profession now join the journey.

TABLE I
Correlation between the size of holding (in acres) and cost of
production per maund for paddy and wheat

State/Year/Crop	Correlation with			
	Cost A	Cost C	Operational cost	Fixed cost
1	2	3	4	5
PADDY				
West Bengal (1954-57)				
Aman	0.55*	-0.47	-0.23	-0.62*
Aus	-0.005	-0.30	-0.068	-0.05
Madras (1954-57)				
First Season	-0.52	-0.42	-0.61	-0.42**
Second Season	-0.04	-0.02	-0.73**	-0.84***
Third Season	0.04	-0.85***	—	—
Orissa (1958-60)				
Aman	0.94***	-0.87***	-0.83*	-0.31
Andhra Pradesh (1957-60)				
First Season (irrigated)	0.60*	0.16	-0.41	0.31
Second Season "	0.54	0.10	-0.29	0.23
Kerala (1962-63)	0.16	-0.51	—	—
Madhya Pradesh (1962-63)	0.14	-0.83**	-0.56	-0.70**
WHEAT				
Punjab (1954-57)	-0.95***	-0.95***	N.A.	N.A.
1961-62 Irrigated	0.66**	-0.20	N.A.	N.A.
Unirrigated	-0.87***	0.34	N.A.	N.A.
Bombay (1954-57)				
Nasik Irrigated	0.60*	0.74*	0.09	-0.10
Dry	-0.42	-0.58	-0.52	-0.49
Ahmednagar Irrigated	-0.56	-0.73**	-0.67	-0.54
Dry	0.14	0.18	—	—
Uttar Pradesh (1954-57)				
Irrigated	—	-0.63*	-0.29	-0.37
Unirrigated	—	-0.47	0.30	0.31
Rajasthan (1962-63)	0.66*	0.51	0.75	-0.56

*Significant at 10% level

**Significant at 5% level

***Significant at 1% level

TABLE II

Correlation of size of holding (in acres) with human labour input

<i>Corps/Year/Crop</i>	<i>Correlation with human labour</i>		
	<i>Hired</i>	<i>Family</i>	<i>Total</i>
1	2	3	4
Bombay (1954-57)			
Irrigated wheat :			
Ahmednagar	0.81**	-0.56	-0.20
Nasik	0.67**	-0.82**	-0.73**
Unirrigated wheat :			
Ahmednagar	N.A.	N.A.	0.13
Nasik	N.A.	N.A.	-0.65*
Uttar Pradesh (1954-57)			
Wheat	N.A.	N.A.	-0.92***
Rajasthan (Pali) (1962-63)			
Wheat	0.3	0.2	—
Andhra Pradesh (1957-60)			
Paddy :			
I Season	0.74**	-0.88***	-0.31
II Season	0.81**	-0.74**	—
Orissa (1957-60)			
Aman	0.98***	-0.96***	-0.88**
Kerala (1962-63)			
Paddy	N.A.	N.A.	-0.35
Madhya Pradesh			
Paddy	N.A.	N.A.	-0.66

*Significant at 10% level of significance

**Significant at 5% level of significance

***Significant at 1% level of significance

TABLE III
Cost per maund on the basis of different concepts

Crop State Year	Cost C (Rs.)			Bulk line concept	Efficiency concept				
	Minimum	Maximum	Average		Least cost production		Highest cost production		
					% production covered	Cost/md.	% production covered	Cost/md.	
1	2	3	4	5	6	7	8	9	
WHEAT :									
1. Bombay (1954-57)									
Ahmednagar	10.1	23.8	15.9	24.12	14.7	5.0 (N.S.)	12.5	25.0	
Nasik	17.8	36.3	21.3	30.25	7.8	10.0 (N.S.)	15.7	36.0	
2. Punjab (1954-57)	8.65	14.92	12.42	17.33	14.71	9.0 (5.00)	10.0	19.0	
8. Uttar Pradesh (1954-57)	9.9	15.7	11.2	17.00	10.5	8.0 (Below 6)	10.5	18.0	
4. Rajasthan (1962-63)	18.37	18.37	25.05	26.60	16.62	8.0 (6.0)	9.3	32.0 (and above)	

TABLE III (Contd.)

1	2	3	4	5	6	7	8	9
PADDY :								
1. West Bengal (1954-57)								
Aman	9.36	11.41	10.25	13.81*	10.0	6.0 (3.00)	9.0	15.0 and above
Aus	8.49	15.24	11.85	N.A.	N.A.	N.A.	N.A.	N.A.
2. Andhra Pradesh (1957-60)								
I Season	11.57	12.74	12.29	14.67	5.71	7.0 (Below 7.0)	15.2	15.0
II Season	11.45	13.81	12.86	14.87	16.95	9.0 (7.01)	18.5	15.0
3. Orissa (1957-60)	7.93	8.86	8.25	11.20	14.00	5.0 (4.0)	13.0	12.0 and above
4. Kerala (1962-63)	8.58	14.67	9.83	14.41	12.6	6.0 (Below 1.0)	17.0	14.6
5. Madras (1956-57)								
I Season	9.5	21.4	12.4	17.56	N.A.	N.A.	N.A.	N.A.
II Season	5.6	14.6	7.4	10.52	N.A.	N.A.	N.A.	N.A.

Figures in Brackets under Col. (7) indicate the lowest cost per unit at which some output has been produced.

N.S. : Not specified.

N.A. : Not Available.

*Relates to 1955-57.