CHAPTER - II

REVIEW OF LITERATURE
An enquiry was conducted regarding the pace and pattern of the flow of rice and wheat from rural areas into market. Subsequently disposal of supplies by whole sale traders/millers in the 1958 - 59 cropping season (April to March for wheat and October to September for rice). This enquiry was also intended to assess the factors responsible for any change in the behaviour of the producers/traders and consumers in that crop from their behaviour in the previous cropping season. The findings of the survey were:

(a) production of crops was important in determining the flow of surplus
(b) a major portion of the surplus was in the hands of medium and big cultivators, and
(c) the proportion of total sales was considerably small in the first quarter.

2. Podwal (1956), by virtue of vast experience of several countries as Russia, China, and Japan, stated that in order to boost up general economy the volume of marketable surplus has to be increased. This was further elaborated in the paper with special reference to the requirements and problems prevailing in India. He also emphasized that along with the planning to increase production in agricultural commodity steps have to be taken to ensure that marketable surplus should increase in same order. To increase the flow of marketable surplus he has suggested some devices, i.e., firstly, land revenue and irrigation charges should be collected in kind as a result the procurement of foodgrains will increase. Although the payment would be in small quantity. Thus, the cost of collection would be high. He also suggested the price policy should be such which will facilitate the flow of marketable surplus.

An enquiry was conducted regarding the pace and pattern of the flow of rice and wheat from rural areas into markets. Subsequently, disposal of supplies by the wholesale traders/millers in the 1958-59 cropping season (April to March for wheat and October to September for rice). This enquiry was also intended to assess the factors responsible for any change in the behaviour of the producers, traders and consumers in that crop from their behaviour in the previous cropping season. The findings of the survey were: a) production of crop was important in determining the flow of surplus, b) a major portion of the surplus was in the hand of medium and big cultivators and c) the properties of total sales were considerably small in the first quarter.

Mukherjee (1959) dealt with the concept of marketable surplus in agriculture and also the problems of its location and mobilisation and mechanisation to increase the surplus through developmental measures in agriculture.

Bhattacharjee (1960) reported that with the growth in


the monetisation and the pressure of population on land, the contribution of the small farmers to the total marketed surplus tends to decline and that of the larger farmers tends to increase.

6 Mazid (1960) examined relationship between the size of cultivated holding and proportion of cash crop to foodcrops in a study conducted in a few villages in Punjab and Western U.P. He studied these relationships with reference to production and sales of surplus of the crops.

7 Dayal (1960) observed the relationship between marketable surplus of foodgrains and changes in prices to indicate that there existed a backward sloping supply curve. The possible explanation of the existence of such a curve is that the fall in prices might have forced the producers to sell more to obtain non-farm goods.

8 The 20th Annual Conference of the Indian Society of Agriculture Economics discussed problems of marketable surplus in the context of Indian Agriculture. It gave, among other


facts, certain important common factors, which influence the marketable surplus. These are:

i) level of production,

ii) Size of family,

iii) intensity of cropping,

iv) size of holding,

v) nature of the crops grown,

vi) relative price levels of different farm products,

vii) economic status of the farm family and

viii) social conditions prevailing in the market.

9 Saxena (1961) stated that marketed surplus refers to the sale of producer sellers either for cash or for other commodities of necessity on barter. It is different from marketable surplus of producers, in as much as, it refers to the actual quantity of sale irrespective of the necessary allowance to be made for genuine requirement. The total production minus farmer's retention for seed, feed, personal consumption etc. give the measure of marketable surplus.

10 Krishna (1962) explained the limit of elasticity of marketed surplus with respect to price in case of wheat.


Because wheat is an important crop and play a significant role in the Indian economy. In the article he tried to find out of the condition under which the elasticity of marketed surplus with respect to price would be negative though the elasticity of marketed surplus with respect to output was positive. His finding was that as long as the value of substitute effect is non-zero the elasticity of marketed surplus with respect to price would be positive. It was shown that when income elasticity of consumption was 0.8 for wheat and seventy per cent of the elasticity of marketed surplus with respect to price varied between the range of 0.1 to 2.3. The high value of elasticity which would be higher in case of subsistence farmers as the farmers use to consume a large portion of their output initially. Opposite behaviour could be there in case of "commercial farms". In case when the elasticity of output is negative and elasticity of consumption is positive the negative elasticity of marketed surplus with respect to price exists. The negative value of elasticity of marketed surplus with respect to price would occur only when price elasticity of farm consumption was zero.

Sinha (1962) emphasized the important role of marketable surplus in promoting economic development in an un

agriculture country, like India. Sinha expressed the view that in order to force a higher quantity of marketable surplus from the farmer, prices of agricultural commodities must be kept relatively lower than industrial prices.

12
Shastri (1963), showed through a study on four crops (rice, gram, arhar and potato) that production had considerable influence on marketed surplus.

13
Dayal (1963), studied various aspects of the marketable surplus of foodgrains and found that marketable surplus of cereals is concentrated in the hands of big cultivators because the retention for consumption in terms of percentage to total produce is very low as compared to small and medium size groups.

14
Kahlon and Dwivedi (1963), calculated marketed crop surplus from selected holdings in the Ludhiana district. The following factors were taken into consideration in order to determine the flow of marketable surplus.

i) Volume of production.

12.C.P. Shastri, "Inter-relationship between production, prices and marketable surplus in Bihar", Agricultural Situation in India, Vol. 18, No. 1, April, 1963.
ii. Size of holding and tenurial status,

iii. Size of family,

iv. Consumer habits,

v. Relative prices of farm products, and

vi. Accessibility to markets.

For selection of holding in sample villages, they used stratified random sampling technique. The marketed crop surplus was studied under different size-groups of holdings. The analysis revealed that:

i) Surplus depended largely on production level,

ii) The effect of size of holding was more pronounced in case of larger size of holding while in case of cash crops its effect was not pronounced.

iii) Cash rented holding yielded relatively larger surplus as compared to holding leased on a crop sharing basis.

iv) Marked surplus and family size were found to be negatively associated.

v) Surplus was positively related to the consumption pattern in the locality.

vi) Market location in relation to production area was positive.

vii) Marketed surplus was found to be a function of the interaction of all these and other minor factors.


function. The study was based on the data collected from six villages in the deltaic region of Godavari, Krishna, Pennar, and Cauvery. The main conclusions were as follows:

(a) Marketed surplus was mainly concentrated in the hands of a big and medium cultivators who formed a minority in number.

(b) Marketed surplus showed a positive relationship to production and there was very little evidence to show that increase in production would not result in increase in marketed surplus as a consequence of demand for home produced grains.

Jhakade and Mazumder studied a problem on the basis of data available regarding price parity for jute and rice and the acreages sown from 1950 to 1964 in West Bengal, Bihar and Assam. The case of two substitutional crop may be said to be unique in India. In the first place, the bulk of crop was grown comparatively in compact area of those states which together account for about 93 per cent of the jute production in India. The substitution ability between these two crops was almost perfect in the sense land, labour and equipment was readily interchangeable between paddy and jute cultivation. Moreover, it was grown as a cash crop largely by growers whose main crop would otherwise be rice for their own consumption.

requirement. Data indicated that when by and large the price parity had increased, i.e., when the prices had in the favour of jute, acreage under jute had also increased and vice-versa. Thus conclusion was valid for nine years out of the fourteen years. During the same period, again with a few exception, the acreage of paddy had declined, whenever acreage under jute had increased. The decline from this was noticed in few years and attributed to imperfections in the data. The existence of close correspondence between relative prices and acreage do suggest that parity price could be used within certain limits, as an important instrument for regulating the shift in acreage from one crop to another in a desired direction.

Hillman and Loveday presented a simple model showing the relationship which exists between the surplus disposal programme and programme for voluntary supply control of agricultural products. Disposal of surplus had raised problem of their valuation and costs. Production control would present other cost considerations. Value of an action taken by committees of the U.S. Congress which control farm prices and surplus export programmes hold the key to the entire complex. It would be doubtful that the two programmes can be carefully wedded to the satisfaction of those who were interested in

using costs, because the initial nature of the disposal programme predisposes the relevant Congressional Committees to rationalise and expand production. The author feels that food aid for economic development possibly should be pushed more than in the past; but even here the values held by Congress and opinions by economists, will prevail.

19 Dandekar had forwarded a critical evaluation on the hypotheses that was forwarded by Khatkhate, Mathur and Ezekiel that price responsiveness of farmers was zero. Firstly, the author analysed the cases that from which sub-sectors in agriculture the surplus was flowing. He recognised that large farmers, though small in number disposed 60 per cent of their produce. Whereas, small farmers being large in numbers disposed 25 percent of their produce. The small farmers would always act as consumers rather than producers in comparison to large farmers, in the case of rising prices of foodgrains. Secondly, in the falling prices the foodgrain supply would be more and Khatkhate considered it as a stunted paradoxical. The


author in this context pointed out that there was nothing wrong or paradoxical as to the farmers of the lower end of income ladder in an nonmonetised economy. Thirdly, the statement of Mathur and Ezekiel "demand for cash income were nearly fixed", was criticised in the sense that consumption behaviour of farmers could not be explained in terms of the elasticity of demand and marginal propensities to consume, as the pattern of consumption (i.e., in terms of consumption goods) were different indifferent types of income groups. Fourthly regarding the statement of Mathur and Ezekiel "demand for cash income is fixed or nearly fixed ". Khatkhate referred it to as "non-agricultural necessities, as land revenue, rent etc."

According to author, this statement was erroneous since the farmers cash needs were not fixed at all in the sense there were few irreducible minimum needs which must some how be met. A great many needs would remain unsatisfied, e.g., consumers need in respect of their produce, consumers needs of other goods, which they must buy, and innumerable producer needs for working and fixed capital. It was considered to be a pure myth, that even small farmers in underdeveloped countries would respond very differently to normal economic stimuli.

Fifthly, the author criticises the statement of Olson that Government be improvement of knowledge and extension of

drainage, irrigation and liberal facilities of credit etc. Here the author pointed out that living standards and repayment capacity of the farmers were improved, the aggressive extension methods adopted by any Government would likely to fail. Sixthly, the author criticised Khatkhate's statement 'Savings of the subsistence sector are not affected in which every way the agricultural prices moves'. The author pointed out that farmers could not achieve short term balance through savings and dissavings and a long term balance could also be achieved.

23 Sharma studied the household schedules of 1961 census relating to the states of Andhra Pradesh, Mysore and Uttar Pradesh on aspects such as distribution of households, cultivated area, total agricultural workers and agricultural population and found a relationship between size of holding and marketed surplus.

24 Krishnan forwarded a critical review of given ideas on prices and the behaviour of marketed surplus of foodgrain in India. According to one hypothesis, the marketed surplus was inversely related to prices. Under very restrictive conditions, given certain magnitudes of income and price

elastici ties of demand for foodgrains in the agricultural sector, a negative elasticity of marketed surplus was, no doubt, possible. It was further argued that this was a purely static case. When agricultural production grows, the elasticity of marketed surplus would be invariably positive. As far as second hypothesis, according to which farmers had become more price conscious. It was shown with data on market arrivals for rice, that the proportion of distress sale by farmers had not declined.

25
Dandekar argued that the programme for setting up and operation of minimum support price was possible without active reference to costs of production, viz. establishing an agency that would buy whatever foodgrains were offered at the minimum support price and resell in a manner that would not depress the market below the support price. In this first stage ceiling prices were a corollary to support prices and supporting the price would be justified only if there was evidence that higher support price would lead to higher production.

26
Rath studied the seasonal pattern of wholesale prices

of movement of jowar in seven markets in the states of Maharashtra and Mysore. The aim was to discover (i) if wholesale jowar prices in these markets reveal a persistent and identifiable seasonal pattern, and (ii) if there was persistent "excess rise" in the wholesale price of jowar in these markets, from the low levels in the post-harvest period to the subsequent pre-harvest months. Seasonal price index was computed by the twelve months moving average method, did not reveal any clearly persistent seasonal pattern in three of the markets. Comparison of actual price differences between the post-harvest trough and pre-harvest peak with independently estimated costs of storage etc. that there were often warranted or less than warranted rises during the season as there were years of excess rise.

27 Mandal studied the price changes of rice, wheat, maize, gram, jute and raw sugar in Eastern India between the years 1953-61. Data were collected from published and unpublished official records, but these were inadequate and too inconsistent on specifications of quality and variety to permit in drawing of definite and scientific conclusions. This study suggested, however, that for each commodity spatial

Differentiation in price was greater in a year of higher price level, thus indicating a possibility of uneven distribution, playing more important a part than short fall in production in raising the prices of commodities.

Rao tried to explain the farmer's marginal and average propensity to sell in relation to his output of all crops. The study was conducted in Walidpur village of Meerut district in Uttar Pradesh. In the first case, relation between output and sale was examined and in the second, family size was taken into account to see whether its inclusion had any significant effect on sales. Output and sales were studied in terms of per capita terms. Regression equations were used to estimate sale elasticities. It was concluded that there was a tendency of declining output elasticity of sale with an increase in output. The decreasing output elasticity of sale was consistent with decreasing output of consumption or income elasticity of consumption.

Nagaraja discussed the significance of marketable surplus in the context of planned development in Indian economy. The problems relating mobilisation of marketed surplus and the

factors which would assist in mobilising the surplus were also discussed. He listed some important reasons that limited the mobilisation of marketed surplus, these were (a) very low per acre productivity, (b) the increased propensity to hoard in traders, middlemen and growers, (c) rise in prices and (d) speculative tendency of traders and middlemen. He suggested some long term and short term measures to increase the marketed surplus.

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Bhalerao and Lal made an attempt to study the pattern of disposal of marketed and marketable surplus of maize in Jaunpur district of Uttar Pradesh. They found that (a) small cultivators had no marketable surplus, (b) the marketable surplus had a positive correlation with the increase in size of holding, (c) increase in the retention of stock was with the increase in size of farms, (d) the proportion of produce for home consumption to total consumption was found to be decreasing with the increase in size of holdings.

31
Krishna had analysed the marketable surplus function throughout the country. The source of data was from various Agro-Economic Research Centres of the country. The author had

analysed the implication of linear functions and as well as of the non-linear functions.

In linear function the marginal propensity to sell was constant over a wide range of output, above the minimum subsistence output. The average propensity to sell increased as the output increased, but at a decreasing rate. Elasticity of sale with respect to output was positive. It decreased as the output increased. The elasticity of aggregate surplus was in the range of 1.04 to 1.60. With these results of linear function the author tried to explain the behaviour of large and small farms. He contradicted the widely belief ".......that output increases on relatively small farms are likely to swallow up ..........those on large farms are likely to flow into the market" and concluded that the supply behaviour of small and large farms were similar. Because the large and small farms sell the same additional quantity above minimum output. As the marginal propensities to sell (or consume) was indifferent. Output size structure of farms had no impact on marketable surplus at least for a subsistence crop. Finally, in connection with the constant propensities to sell there was no need of administrative measures to squeeze out the additional output by the Government, as the farmers sell their output voluntarily with the increase in output. This was true at least in linearity zone, as the author had marked.
From the nonlinear form of marketable surplus, the author had shown that village with small holdings, output and income and villages with large holding, output and income behave similar in marginal propensities to sell. Concluding that the very rich and very poor farmers had nonlinear (quadratic) functions. This explained that they would sell more as their output would increase. Thus, the author had suggested to calculate the variances of holdings, output and income to have a better understanding of marketable surplus in non-linear functions. Regarding policy implications, the large farms were in favourable position than the small farms as the large farms had increased their sale with the increase in output. Thus, in small farms the question of alteration of farm size structure was viewed and suggested that it could be done safely by increasing the consumer density on the family size.

The author had also tried to explain income as one of the variable in explaining the marketable surplus. He had calculated the $r^2$ (coefficient of determination) between many variables (including income) in order to judge the superiority of the variables. He concluded that in marketed surplus function, output and income were equally good independent variables. But he had preferred output than income. Reasons being that output explained majority of the variation and also sales could not be predicted from income without having data.
of total income. The acreage could be taken as a proxy to output. The acreage was in turn a bad proxy to yield per acre, as the yield had varied from farm to farm. Total income could be used as a proxy of the total area cultivated, but it was treated as a bad proxy, though the total income and cultivated area were positively correlated. The author stressed that while considering the cultivated area the quantity and quality of inputs other than land must be considered.

32.
Rao contradicted the earlier findings of Raj Krishna regarding the behaviour of small and large farms in relation to marketable surplus. The author pointed out that while judging the nature of marketable surplus of a subsistence crop, the total surplus from all crops to be considered. If the nature of marketable surplus of crops other than subsistence crop had showed similar results, then the statement could be valid. It was pointed out that the small farms always known to consume inferior quantity of cereals. The small farmers always acquired a considerable amount of cereals of subsistence crop from the large farms as wages. If such was the case, the marginal propensities to sell would increase. On the other hand, Raj Krishna had overestimated the marketable surplus on

large farms as he had not deducted the kind payments from production. Deduction was necessary, as in most of the areas the mode of wage payment was not fully monetized, but partially monetized and partially paid in kind.

The presence of intercorrelation among variables and the family size was not held constant. Thus, in Raj Krishna's marketable Surplus function the family size turned out to be a non-significant variable. This disapproved the hypothesis that per capita changes in consumption in response to change in the per capita income of large and small farmers.

The non-linear behaviour of large farms were due to marketing more of non-food crops were taken into account. The productivity of land could be increased irrespective of the size of holding. So the farms could behave in a non-linear fashion. Thus, the author had suggested, the hypothesis of size and structure can not be disapproved from a study of subsistence crop.

The author argued that Raj Krishna had mentioned "the subsistence crop under study would become highly commercial after certain level of income is reached". It was not due to subsistence crop would be commercial depending upon the area under it. Also subsistence crop may become non-linear if it was a highly profitable crop in that place. Further, Raj Krishna had not considered all the crops, as the area under study were not at all of monoculture farms.
The linearity zone hypothesis could be proved only when the crop under study was a predominant crop and if there were other crops, then the marginal propensities to consume (sell) would be constant over a wide range of income for a subsistence crop.

33

Krishnaji commented on Raj Krishna's article on some important methodological issues of sampling. It was not clear from the article whether the earlier author had followed purposive sampling, stratified or random sampling, or it was a study of poststratified samples. In the present context, the author had tried to explain the fallacies, if at all it was a purposive one. In purposive sampling the conditions of residuals were grossly violated, it could not be predicted and also be tested satisfactorily. For example, it was stated that in a linear function of marketable surplus, if output was placed in the 'X' axis, i.e. output on the right hand side, the scatter diagram above the higher output tends to deviate from true regression line. Thus overestimating the 'b' values of a linear function. Also in purposive sample certain classes of output had stressed two questions to be considered while taking the linear function into consideration (a) how were the

'big', 'medium' and 'small' farmers defined? (b) what was the precise procedure of sampling?

Mazumder commented against the linear and quadratic functions of Raj Krishna. In linearity concept, it was pointed out that while taking the aggregate of farms, the position of different farms on the output-scale was ignored. The large farms which had increased their output same as the small farms, sell. The author pointed out that this concept was not taken into consideration for empirical analysis, instead a weight was placed by the former author.

It was also pointed out that Raj Krishna concluded that elasticity of marketed surplus was more than unity and had decreased towards unity as the output had increased. Thus, the elasticity of consumption to output had increased as the output had increased. Since theoretically income elasticity of consumption increases as the income increases, but empirically it was shown by the previous author that income elasticity of consumption had decreased. Thus, linearity hypothesis had lead to unreasonable findings.

Regarding the estimates of quadratic function, the author had tried to estimate the marginal value of output in relation to marketable surplus. A model was fitted to test the

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marginal values of the 'critical' level of output, after which the farmers would sell their output to the market. Below this 'critical' level, farmers would sell their output. They would bring a lower amount of output to the market. The value would obviously be negative and of a small numerical value. The 'Marginal propensity to sell' would be slow under the 'critical level' and rapid after the 'critical' level.

Prasad commented regarding Raj Krishna's article on three grounds: (a) sampling procedure, (b) subsistence level, and (c) price of the subsistence crop.

In sampling, the author had pointed that the study must be of All India Relevance. The sample should be free from bias or prejudice. The conditions of samples must be same for all items, as the samples contained purposive, census samples and also random samples. Further, the samples mostly selected were from Punjab and Western Uttar Pradesh. These states had generally surplus in large quantities. The author pointed out that the samples would have been selected from the subsistence states like Eastern U.P., Bihar, Orissa and West Bengal. Raj Krishna selected 'big' as well as 'medium' and 'small' farms in his purposive samples to analyse the marketable surplus of a subsistence crop. The author had also wondered regarding the use of selecting all the three sizes, when it was already

decided to analyse the conditions of subsistence farms.

Raj Krishna had stated that "marginal propensities to sell" out of the output of a subsistence crop was consistent over a wide range of output. The proportion of farmers varied from 5 to 46 per cent below the minimum subsistence output. The present author had pointed out that the proportion of farmers would be more, if the study were conducted in a densely populated area. The distress sale could have occurred when the consumption articles, as salt, kerosene, clothings, etc. are subsequently purchased and they were forced to live on less than subsistence diet. When prices had increased the farmers would sale less amount and increase their food intake, as their money needs had been satisfied. The author had pointed out that during "Great Depreciation" the cultivator remain under feed in falling prices, as they sold most of their output. Further farmers who were in debt to money lenders and traders would sale their produce at predetermined low prices. Thus, the author concludes that the farmers would not remain under feed due to money pressure and would increase their sale with the increase in output.

Further, the validity and applicability of Raj Krishna's study was questioned, as the price of the produce was totally ignored. The farmers would satisfied their income due to the
inflationary pressure, resulting in the rise of prices. This would lead to part with a small part of their produce.

36

Shah related some of the important variables with marketable surplus, which had something to do with production. These variables were (a) acreage planted to cash crops divided by total acreage under crops, (b) acreage planted to marketed crops (i.e. area under cash crops plus area under food crops) x sale of food crops divided by total food production and the whole was again divided by the total acreage, (c) size of family, (d) distance in kilometers from a market centre, (e) debt in rupees per acre of area planted to crops, (f) size of holdings in acres (owned, rented in and out, and area per fragment), (g) per acre yield of foodgrains in quintals, (h) percentage of irrigated area to cropped area, (i) farm assets, (j) level of improved technology and (k) prices of inputs in crop production.

Among these variables, those had individual contribution in market supply were of farm assets, debts, tenancy, fragmentation, level of technology, prices and cost of items (mainly inputs) in production and distance. Of them, farm assets influenced all measures of surplus. Debt and fragmentation influenced surplus, measured as proportion

either to total output or to total area. Tenancy on the other hand, influenced the absolute value of surplus. Thus, a tenant would market as much as an owner cultivator from a given quantity of output. Since extreme fragmentation would be a protective device against deteriorating conditions, for a given output, greater fragmentation would result to a lower percentage of marketed surplus to output. Debts influenced the percentage value of marketed crops to production and acreage allocated to marketed crops because debts created a fixed charge on production in terms of cash. Further production and distance from the farm to the market was very important in raising the marketed supply of foodgrains. This study showed that reduction in distance from market centre by a mile raised the percentage of marketed surplus by about 1.8 to 2.2 points in Kodinar, where acreage and not production was an independent variable. In Rajkot district too, the influence on acreage allocation was similar. Against this, production increased on one rupee, increase the value of crop by 75 paise in Kodinar and 99 paise in the Gujarat region. Further, one rupee increase in production raised the percentage of marketed crops to output by 1 point in Kodinar. In case of percentage acreage allocated to marketed crops one rupee worth addition to output raise the farmers marketed surplus by 0.47 in Kodinar, but in Gujarat region the rise was
by 0.0024. The influence was larger in Kodinar but half of it was due to larger acreage under marketed crops.

The influence of distance on marketed surplus was mainly indirect through its influence on production and might be due to: (a) cost of transportation giving rise to price differential, (b) external capital rationing being severe in places away from market centre, and (c) lack of market information in distant places. Major influence was due to factors (b) and (c) as the average distance was five miles (and a standard deviation of 3 miles), a mile nearer would not raise the percentage of marketed surplus to output if transportation cost was the only consideration.

Vyas and Maharaja made an attempt to study the nature and behaviour of marketed surplus in two homogeneous tracts, (a) the Himatnagar tehsil of Sabarkantha district of Gujrat, (b) Desuri tehsil of Pali district in Rajasthan. Cross sectional data were collected from six representative villages from both the tracts. In the analysis marketable surplus assumed to be a function of (a) production of crops, (b) area sown, (c) the family size and (d) other disposal in kind.

The data were further analysed in order to see the behaviour of marketed surplus and the factors affecting the flow of marketed supplies in various size groups. A few salient conclusions of the study were as follows:

(a) Total marketable surplus as a percentage of total crop production was generally found to be higher on the higher size groups.

(b) Marginal increase in marketable surplus in relation to increase in production of superior cereals as well as coarse cereals, were positive and significant.

38 Lavania et al. considered few aspects of marketing of agricultural produce in Eastern Uttar Pradesh on the basis of data collected during 1963-64 from twelve purposively selected villages as well as eight markets where these major commodities were mainly marketed. Study revealed the existence of the problem, such as, high price spread due to multiplicity of charges and market functionaries, distress sale of agricultural produce and marketing malpractices, which can only be solved by co-operative marketing services and establishment of regulated markets. It further showed that

some development, beneficial to producers such as confirmation of ownership on tenant, provision of cheaper institutional finance and storage facility to cultivators already affected the flow the marketed surplus.

39 Ezekiel strengthened the thesis of Nurske, who recognised the possibility of increased consumption of food by the labour remaining and as well as withdrawn from it. A reply had been made to the criticism which had been brought against Nurske's theory. Distinction was drawn between total output and farmers income. The problem of saving was also considered. The problem of feeding the surplus labour which was withdrawn from the land required more careful attention.

40 Behrman studied the supply response of the marketed surplus of foodgrains in agricultural sector of less developed countries. He estimated the price elasticity of marketed surplus in case of rice in Thailand. The article presented a model in which the price elasticity of marketed surplus was measured in an indirect way. The model was in contrast of that of Raj Krishna's in the following manner. Behrman's model


gave negative estimate of the price elasticity in comparison to that of Raj Krishna’s model. In both the model the value of sales ratio was same. Secondly, in Behrman’s model, a short period of partial adjustment had been followed for its practical utility for policy purposes. Whereas, long period adjustment was the main theme of Raj Krishna’s model.

41. Gill studied the existing conditions of transportation of produce in Ferozpur district of Punjab. The objective of the study was (a) to study the modes of transport and their percentage contribution, (b) transportation charges by different modes, (c) limitation for different modes and possible improvements. It was observed that bullock cart was the most common mode of transportation of produce and it was about 70 per cent. Tractor trolly ranked second, which amounted to 18.2 per cent followed by donkey (5.1 per cent), trucks (3.7 per cent), camel (2.5 per cent) and tonga (0.5 per cent). The donkeys were used in water logged areas, the camels were maintained by village traders, trucks were in possession of traders in big and small markets and tongas were used by small farms on metalled roads. Charges of transportation were lowest in trucks, and by donkeys it ranged to the highest. To mitigate the situation, it was suggested

that (a) roads, bridges on water channels were to be maintained by panchayats, market committees and development departments, (b) approach roads in water logged areas were to be metalled and (c) the market committees, warehouses and co-operative marketing societies should purchase vehicles and hire them out at reasonable rates.

42

National Sample Survey conducted a study on non-mechanised transport during July 1959. The salient findings were (i) altogether 23.16 lakhs households were engaged in non-mechanised transport, out of which 87.56 per cent households belong to rural areas and only 12.42 in urban areas. Of the 20.30 lakh household engaged in rural transport, 2.23 lakhs took it as main enterprise, (ii) due to seasonal nature only 34.43 per cent of the households worked in rural areas, (iii) bullock drawn or buffalo drawn carts constituted nearly 72.69 per cent of the total different modes of transportation. Other modes of minor importance, (iv) the total number of persons employed in transport enterprise were 11.29 lakhs of people. In rural areas totally 8.38 persons were engaged in transport enterprise, (v) totally 7 to 8 crores of working animals were engaged in rural India for

transport of which bullocks and cows constituted 89 per cent of the total, (vi) the cost of maintaining the 7 to 8 crores animals worked out to Rs. 35.14 crores per week, of which 6.18 crores were purchased and 26.96 crores were supplied from household sources.

Planning Commission conducted a study on the role of bullock carts in rural markets, with reference year as 1959-60. An attempt was made to collect the data of the 1949-50 in order to have an effective comparison. The survey was conducted in five selected markets, (a) Tindivanam in South Arcot district of Madras, (b) Lasalgaon in Nasik district of Maharashtra, (c) Sirhind in Patiala district of the Punjab, (d) Gorakhpur in Gorakhpur district of Uttar Pradesh and (e) Sainthia in Birbhum district of West Bengal. Bullock carts constituted to be the most common mode of incoming traffic of the markets in 1949-50 as well as 1959-60. But with the introduction of trucks, the percentage by carts declined slightly in 1959-60. The share of trucks were larger in higher distance groups and also handled relatively greater valuable crops, e.g. cotton in Sirhind, onions in Lasalgaon and paddy in Sainthia. 90 percent of the carts in these markets came from a distance not exceeding 20 miles.

As regards to outgoing traffic railways carried 58 to 57 per cent of the outgoing traffic in all mandies except Tindivanam. As most of the outgoing traffic was for long distance, so the rail despatch was handled by trucks. It also indicated that within a span of 10 years truck borne traffic gained a considerable momentum. Inter-mandi traffic was mainly carried by bullock cart or thelas.

Within the interland of the 3 mandis, Tindivanam, Sainthia and Sirhind, almost all incoming traffic were by carts. As in most of these markets the distance was negotiated by katcha roads, except in Gorakhpur villages 77 per cent were borne by trucks.

Within a span of 10 years the number of carts had risen from 16 to 49 per cent in villages of the four mandis (Tindivanam, Lasalgaon, Sirhind and Sianthia). Except in Gorakhpur it had decreased by 16 per cent.

Lakshmanan tried to explain the role of bullock carts in transporting the marketable surplus of paddy with as the published reports from various sources. He tried to explain the conditions of bullock cart transport in India. The rise in number of bullock carts were much faster than the rise in

44. Lakshmanan, P.P. "Transport of Paddy from the Farmers to the Markets of India". Agricultural Situation in India, Vol.22, No. 4, pp. 361-368, July 1967.
marketable surplus. This was true in all the three markets like Tindivanam, Sirhind and Sainthia, except in Gorakhpur there was a decline. The number of trucks had penetrated the markets due to the prevalence of connecting roads from the village. Secondly, due to processing concerns, who were engaged in processing as well as in wholesale trade. The replacement of tyres by pneumatic tyres was suggested in bullock carts. Firstly, by their replacement the more produce could be brought. Secondly, these wooden wheels caused a great damage to metalled roads. Thirdly, the production programme of this type of bullock carts (with pneumatic wheels) could be taken up as an industry in the rural areas.

The case of Maharashtra, was cited to stress the improvement of roads. In Maharashtra, only one-fourth of the roads connecting markets were main roads maintained by P.W.D., rest three-fourth of the roads were cart track left on the mercy of Panchayat authorities. It was also cited that only one-third of villages could take their traffic throughout the year. Nearly 12 per cent to 18 per cent of the villages were obstructed by monsoon due to flooding of rivers and nallahs and rest 42-45 per cent of villages faced unserviceable roads due to the muddy condition.

Laksmanan concluded that there were three main features of Indian transportation system, distinguished by (a)
a thin grid of low capacity of each food producing and consuming areas, (b) scattered focal points within these routes which serve as distribution centres connecting the major cities. The links were weakest in rural areas. The rural transport system was, however, crucial for food supply problem and lack of an efficient rural transport network was severe limiting factor in the attempt to increase the agricultural productivity. Road surfacing was bad particularly in rainy seasons. The bullock carts continue to be the most important mode of transportation. Since it can also be employed in various agricultural situations.

The Joint Technical Committee for Transport Planning considered the problem of foodgrains transportation in rural India. The committee also concluded to the same findings as of Laksmanan, Gill and others.

Mellor stated that the function of agricultural

prices were (a) the allocation of resources signalling both producers and consumers regarding agricultural production and consumption, (b) the distribution of income and (c) influencing the capital formation. The functions were analysed in the light of the relationship between agricultural income, production and prices. Short term weather related to changes in production, accounted the fluctuation of agricultural prices about the trend line. There were a few cases, where a positive price policy could be useful, e.g. open market, buffer stock operations to mitigate short term fluctuations on account of weather conditions and also smoothing changes in price relationship in a dynamic agricultural economy. However, the result of buffer-stocks and alternatives such as two-way price system from the point of view of production were difficult to measure. The conclusion was that, changes in agricultural prices had conflicting influences; and as such, had only a minor role, as a tool of public policy for simulating agricultural development. A more useful tool was technological change. In this situation great caution was required in formulating or criticising an agricultural prices policy. The accumulation of data for low income agricultural commodities and preparation of models on this was indispensable.

Mellor and Dar studied the price index for foodgrains
in India for 1949-64 as a function of a set of real demand and supply. More than 80 per cent of the variation in foodgrain price index was associated in these independent variables. The upward trend in foodgrain prices was associated primarily with expansion of money supply. There was little evidence of government foodgrain price policy having affected the trend of relative agricultural prices. The coefficient on the lagged supply demand variable suggested that year to year changes in farmer’s storage were an important determinant of foodgrain prices in any one year. The implication of these findings in relation to agricultural and industrial growth, monetary and fiscal policy, agricultural price and buffer stock policy were discussed.

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Krishna showed inadequacy of the available economic models for suggesting rational structure of support prices in Indian agriculture. A modified production function model was constructed to overcome some of the observed deficiencies. Farm demonstration data from Intensive Agricultural District Programme (IADP) are was used to work out the estimates of


Incentive prices under demonstration and controller areas. The findings indicated that realised prices for the selected farm commodities for the year under study were significantly high to provide and adequate incentive for farmers for the adoption of improved practices as contained in the package.

Cummings pointed out that the issue of foodgrains marketing in India concerned about the effectiveness of composition, but exists a little empirical research on which the issue could be evaluated. The article analysed the pricing effectiveness in one private wholesale wheat market in Northern India by comparing average seasonal and spatial price differences with estimated storage and transport costs. The comparison indicated that correspondence between average price movement and average cost differences was reasonably close.

Mandal and Ghosh carried out a field investigation in 1960 in West Bengal and Orissa and attempted to find out how far marketed surplus increased with the increase in production and what conditions were necessary to promote marketed surplus apart from increased production. It was found that marketed surplus increased with the corresponding increase.

in farm size and output, (ii) marketed surplus of agricultural products was largely determined by the supply of industrial goods in the agricultural sector, (iii) supply had a definite impact on demand, and (iv) consumption and investment could definitely be widened by the proper dissemination of knowledge and increased access to new production technology.

52 Kalra pointed out that in India, problems of marketing and storage had been accentuated by imports of foodgrains. Apart from the imported foodgrains were procured by the Government through a levy on producers, millers and traders, and in some cases through monopoly purchases. The aim of government zonal restrictions on the movement of foodgrains was to absorb surplus foodgrain in the surplus states to help the deficit states, but in practice surplus reported low availabilities. To regulate the marketing of agricultural products and to protect farmers in dealing with traders, various state Governments have enacted the Agricultural Produce Market Acts and establishing regulated markets. Central and State Government function tended to overlap and there was a duplication even at the Central level. In addition, difficulty arose because no distinction was made between Government regulatory and trading functions. The

government had underestimated the magnitude of the job of trading in foodgrains, and good departments had proliferated both in the Centre and States. One estimation puts the cumulative loss on State trading between 1943/44-1966/67 at Rs. 2,359 millions. Although additional warehouses were being built by the Central and State Warehousing Corporations, as well as privately. Co-operatives were not making full use of facilities provided. It was concluded that Government should be more actively concerned with enforcing its regulatory powers and not to be satisfied merely administering business or commercial operations.

Kahlon and Vasistha studied the key factors that governed the marketable surplus crop (including food crops as well as cash crops) in Ludhiana district of Punjab. The key factors studied were (i) volume of production, (ii) size of holdings, (iii) consumption habits of people, (iv) size of family, (v) relative prices of different farm products and (vi) accessibility to markets. The size of holdings had significant impact on the marketed surplus of food crops. But in case of cash crops size of holdings had no significant impact. The partial correlation coefficients between marketed surplus and volume production (size of holding as constant).

was positive and significant in case of maize, but was positive and non-significant in case of wheat. The marketed surplus and family size was found to be negatively correlated. High correlation was observed between marketed surplus and size of farms, higher was the size of family. Large holding preferred maize than to wheat. It was due to the fact that maize was substituted due to its higher price than that of wheat, village sales were found to be small. Yet negative correlation was found between distance and marketed surplus.

Sharma studied the relationship between consumption and marketed surplus of a subsistence crop in a deficit village on the basis of a survey in 1967 in Rajasthan covering 235 farm families. Details of receipt and disposal of foodgrains were obtained. As no single foodgrain dominated in consumption, "grains" referred to the aggregate of wheat, barley and gram and bajra for consumption and it averaged to 32 ounces per day per standard adult unit. Consumption of non-cereals food as milk, fruits, vegetables, egg and meat were negligible. Consumption of different grains at different income levels as estimated from four equations, showing the ratio of consumption of each grain to total grain consumption.

as a function of gross income. The proportion of wheat, barley and gram eaten appeared to rise with gross income, while that of bajra had fallen. Marketable surplus defined as output minus retention for consumption, seed and feed. Four alternative equations were estimated showing marketed surplus per capita output, acreage under cultivation, acreage under grains, and gross income. It was concluded that marketable surplus depends upon output rather than consumption. The investigation also showed that an increase in marketable surplus had to be distinguished from a decrease in consumption in a deficit area, in order to understand the marketable surplus relations in a region.

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Bardhan and Bardhan analysed the marketed proportion of cereals marketed in India by an indirect estimation method. Also they projected the amount would be available at the end of Fourth Five Year Plan. They had taken price and income as independent variables in explaining their model. The data was made available from census population data, National Sample Surveys data for per capita consumption, data on Government distribution and the output data were either from National Sample Surveys or from Ministry of Agriculture. The author ruled out the possibility of using market arrival data.

collected by the Ministry of Agriculture, as data related to some organised markets and often Government Procurement Policies were away from the flow of foodgrains in the market. Roughly, the method was, estimates of urban and rural population, were obtained, these were multiplied by their per capita consumption of cereals available from various National Sample Surveys. The total consumption of cereals were arrived at. Then the total consumption of non-agricultural population was deducted from that the Net Government Distribution were deducted, ultimately the estimates of marketed surplus were arrived at. Difficulties were faced in calculating the estimates of marketed surplus as the National Sample Surveys and Ministry of Agriculture both published the output data. It was interesting to note that the official estimates of Ministry of Food and Agriculture were low than that of National Sample Surveys. Thus, it lead to different proportion of marketed surplus. It was interesting to note that the direction of movement was same for both the estimates. Finally, the marketed surplus was estimated between 31 to 34 per cent at the end of the Fourth Five Year Plan (1973-74) over 1964-65. Abstracting from the trends, it was noted that the elasticity of marketed surplus with respect to agricultural output, was less than unity, was positive and significant.
Thamarajakshi studied to what extent the non-agricultural and agricultural prices had affected the marketed surplus of foodgrains in India. The estimates were arrived from various rounds of National Sample Surveys and from Central Statistical Organisations. The study related to 1951-52 to 1965-66. As far as movement of prices are concerned the period was divided into two parts, (i) from 1951-52 to 1955-56 a fall in prices and (ii) from 1955-56 to 1965-66 rise in prices. There was positive but significant correlation between prices paid by the agriculture and those received by agriculture in the case of products for (a) intermediate use, (b) products for final use and (c) products for all uses. The annual rate of increase in the Value of marketed surplus at constant prices had been fast both absolutely and relatively (a) in terms of trade (b) agricultural production. Though marketed surplus and agricultural production had expanded at a less faster rate than index prices received by agriculturists. The net barter terms of trade had improved at a rate only by 0.51 per cent per annum. The marketed surplus had risen at a faster rate (2.90 per cent) at constant prices than that of agricultural production (2.74 per cent).

The rise in marketed surplus had increased from 39 per cent to 56.

44 per cent from 1951-1952 to 1965-66 respectively. Marketed surplus was regressed with respect to terms of trade and agricultural output. Linear and log-linear regression equations showed that the terms of trade with respect to marketed surplus were statistically significant and the elasticity of marketed surplus to total output was less than unity. It was also noteworthy that while in the case of agriculture, the percentage of her expenditure on non-agricultural products for final use vis-a-vis these intermediate use had declined, through marginally, the percentage of non-agriculture's expenditure on agricultural products for final use had decreased substantially, relative to those of intermediate use.

Thamarajkshi estimated the effect of prices and production of foodgrains on marketed surplus, where foodgrains referred to rice, wheat, jowar and gram. The study related to the period 1951-52 to 1965-66, as in her earlier study the estimation was indirect one, making use of data from National Sample Survey data and from Central Statistical Organisation. The time series estimates showed that growth of foodgrains were at the rate of 3.7 per cent per annum. The foodgrain

prices of all the agricultural products purchased by non-agricultural sector for all uses had risen at a rate of 3.14 per cent, in comparison to this, the price of non-agricultural products purchased by non-agricultural sector for all uses had risen only by 2.62 per cent. Contrary to this, the output of foodgrains had grown at the rate of 2.4 per cent per annum, while the marketed surplus had risen at annual rate of 2.3 per cent. The marketed surplus of foodgrains when regressed with respect to index number of foodgrain prices and index number of foodgrain output resulted in negative of coefficient in prices. This showed the subsistence nature of Indian Agriculture policies such as research on evolving new varieties to be strengthened. The technological change which had brought out demand in fertilizers and irrigation were to be met. Thirdly, the efficient and smooth functioning of transportation system were to be evolved, in order to decrease the margin between producers and consumers. The announcement of support prices for agricultural commodities would be modestly calculated by the interaction of demand and supply curve. The level should be fixed below calculated supply-demand price, in order to protect the farmers, as well as the processors and livestock feeders from market imperfections. Lastly, the support price were to be announced just before the harvesting season. The seasonal variations in prices and
transportation cost would be such that the Government were not thrown out of the system by private traders.

Sinha et al. studied the marketed surplus of a Development Block in Darbhanga district of Bihar. Their study related to a cross-sectional study comprising of 209 farmers. The salient findings were that small farmers had no marketed surplus. Whereas, the medium farmers had maximum amount of marketed surplus. The large farms had comparatively low marketed surplus. Of the total 209 farmers as many as 77.9 per cent of farms did not have any surplus. The number of farms were about 11.9 per cent in the range of 0-10 quintals of surplus. As the quantity of surplus increased the percentage of farmers decreased. Of the many types of regression models tried, the linear model turned out to be the best one. The marketed surplus was regressed with respect to output. The marginal propensities to sale showed the same behaviour as of marketed surplus by farms. The marginal propensities to sell was less in small farms, it increased in medium and finally decreased in large farms. As regards the elasticity of marketed surplus, retention level, the same trends were observed. The village sale was cent per cent due

to backwardness of marketing. About one-third of the farmers faced storage problems. The elasticity of marketed surplus with respect to output was negative and more than unity.

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Bardhan studied the price and output response of marketed surplus in some villages of Uttar Pradesh and Punjab. These data were collected primarily by Agro-Economic Research Centre of New Delhi. Marketed surplus was expressed as percent to total output and regressed with respect to (a) production per adult unit, (b) average price of foodgrains received by the cultivators, (c) value of production of commercial crops per adult unit, (d) average income of cultivators from sources other than production of crops, (e) index of concentration of cultivating acreage in village, (f) other disposal of foodgrains, i.e. other than sale minus other receipts of foodgrains, i.e. other than what is produced on farms. A linear regression was fitted with all these variables. Results indicated that regression elasticities of grain production was positive and significant, whereas, the elasticities of price were negative and non-significant. The other regressions had expected signs and level of significance. The positive and significant

regression coefficient of output indicates the marketed surplus was a quadratic function of output (as the second order derivative is positive). Otherwise indicated the marginal propensity to sell would rise with an increase in output. The regression value of output being more than unity explained the sufficient condition that income elasticity of demand of foodgrains would be less than unity. As explained the negative price elasticity of marketed surplus was due to the changes in cultivators income from other sources, than food production (i.e. from commercial crops and sale of milk and milk products). This rise in income generated in the rise in demand for retention of foodgrains to outweigh the negative substitution effect on consumption. Thus it lead price regulation and imports which would result in fall of prices would not effect the marketed surplus of foodgrains, as long as, the income elasticity of demand for foodgrains remained larger in the agricultural sector.

Panchamukhi concluded that rural surplus was desirable in the context of developing economies wherein the mobilisation of rural surpluses might initiate the development in both rural and urban areas. The inter-sectoral transfer, in the context of developing economies were desirable and

possible. It was also concluded that surpluses and banking habits were a direct function of the educational level of the chief earner of the family. Agriculture and service occupations were found to be more conducive in creation of surplus and banking habits. As far as education were concerned, the functional literacy would raise the productivity of farms. The example of ploughing back of surpluses by large farms were cited, as investment was done on land, purchase of machinery and lastly, to purchase consumer goods. A number of policy measures which was suggested were grouped into non-fiscal measures and fiscal measures. Non-fiscal measures in mobilising output surplus were output price fixation, input price fixation, terms of trade between agriculture and industry, supply variation of inputs to agriculture, guaranteeing adequate return on surplus investment, creating proper avenues for surplus investment, provision of banking facilities, storage, transportation and marketing facilities for the rural produce, promotion of public works and other agro-based industries etc. Non-fiscal measures for mobilising input surplus, on the other hand were fiscal measures like land tax, agricultural income tax, various surcharges and cesses, and newly suggested agricultural holding tax etc. Finally, it was suggested that financial institutions should function more effectively to mobilize rural surpluses.
Mellor et al arrived at the estimates of production of foodgrains in India from 1949/50 to 1973/74 by indirect means. They have estimated the contribution of inputs as irrigated land, unirrigated land, human labour on irrigated land, human labour on unirrigated land, intensification of labour, inorganic fertilizers. Their calculations showed that by the end of 1973-74, the production of foodgrains would be 1,150 million tonnes. By the end of 1983-84, there would be a production of 1,855 million tonnes. Similarly, the estimation of marketed amount of foodgrains by the end of 1973-74 was 61.8 million tonnes. The projected amount for 1983-84 would be 113.8 million metric tonnes. To conclude, there was a growth rate of 2.6 per cent in 1950's. This growth rate was stalled, by falling from 1.5 to 2.0 per cent between 1961-67 and 1970-71. However, the rate appears to have accelerated to over 4.0 per cent. For the whole decade the calculated growth rate was 2.9 per cent, which confirms closely to the official estimate of 2.8 per cent. The fertilizer which accounted next, in increasing production and accounted its major share in 1960's. The use were retarded between 1970-74 to 1973-74.

due to petroleum crises and international shortage. To reach at the projected amount of production, there would be a need of additional 5,000,000 metric tonnes of fertilizers. Irrigation the next crucial input, irrigated foodgrain acreage grew at the rate of 3.3 per cent per annum, this input accounted about one quarter of the increase in production. At the modest rate of 2 per cent growth in irrigation, an additional quantity of 50,000 metric tonnes of foodgrains would be available every year. This growth rate would lead to cover an area of 6,30,000 hectares annually. Lastly, to increase production and marketed surplus of foodgrains, institutional support, such as research for evolving new strains and drought resistant varieties, increased credit facilities to purchase inputs and vigorous extension facilities needs to be strengthened.

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Ramchandran and Gopalaswami studied the impact of area of High Yielding Varieties on marketable surplus in West Godavari district of Andhra Pradesh. They collected data on (a) variety-wise area and production of paddy, (b) disposal in kind of paddy for wages to pay for the farm labourers and for their services, (c) quantity of paddy retained for consumption

purposes and (d) quantity of paddy sold (monthwise and varietywise) to different agencies and the value realised. Marketable surplus was regressed with respect of area under local paddy and area under High Yielding Varieties of paddy. Results supported the fact to have more marketable surplus area under High Yielding Varieties are required to be more than local varieties. Secondly, farmers had grown larger area under local paddy, only a part of the area under High Yielding Varieties. Thirdly, the increase in unit area under High Yielding Varieties raised the marketable surplus of paddy more than the increase in unit area under local paddy.

63 Medani surveyed 600 rainfed farms in Sudden on Sorghum as grain crop during the year 1966-69. Estimation of elasticity of marketed surplus were calculated by taking yield per unit area, price of the crop, family size, on farm consumption and estimates of income were obtained for each of the individual farms over time. Two stage least square technique was adopted in estimating the above explanatory variables. The reason for adopting this particular procedure was to estimate the serial correlation in case of some lagged endogenous variables. The 600 farms were divided in 6 strata, 63 Medani, A.I. 'Elasticity of Marketed Surplus of a Subsistence Crop at Various Stages of Development'. Economic Development and Cultural Change, Vol.25, No.3, pp. 421-426, 1975.
depending on the various stages of development. The first to fourth strata referred to the traditional agriculture, and from fifth to sixth strata was the most modern in agriculture. The first stratum being most backward and simultaneously, the sixth one was relatively most developed. Price elasticities of marketed surplus were positive in all the stages and were statistically insignificant at 5 per cent level of probability. The short term price elasticities ranged from 0.18 to 0.24 and the long run price elasticities ranged from 0.25 to 0.37. In pooled data the short run and long run coefficients were as 0.21 and 0.30 respectively.

The coefficient of on-farm consumption ranged from -0.22 to -0.63 and for the pooled data were 0.54. These estimates at all stages were significantly different from zero at 5 per cent level. The coefficient associated with expected yield were not significantly different from zero at any accepted level, except in stage 4.

For on-farm consumption, demand function of the price elasticities were negative, ranging from -0.36 to -0.74 and were statistically significant at 5 per cent level. The short run price elasticities ranged from -0.2 to 0.28 and the long run price elasticities between -0.9 to -0.32. For pooled data, short run price elasticities were -0.15 and -0.20 respectively.
The coefficients associated with income were in the range of 0.28 to 0.44. The short run and long run elasticities ranged from 0.4 to 0.57 and 0.18 to 0.72 respectively. The estimates associated with pooled data were 0.23 for short run and 0.47 for long run.

64 Haessel made an attempt to develop a model to determine the price responsiveness of peasant farmers as consumers. He developed a model of demand for home consumption, supply of foodgrains marketed and price determination in a close village. Bardhan had used least square method to estimate such price responsiveness of a village in Northern India by taking price and output as exogenous to the system, as the price changes cannot influence the marketing of farmers until next harvest. But the author argues that causation can run the other way, with supply affecting the price in the same period. If a village was reasonably self-sufficient in foodgrains, the price must be endogenous to the system and will be affected by quantity produced and marketed. Thus regression was fitted by two stage least square technique instead of ordinary least square as done by Bardhan.

The estimate was done by taking Bardhan's data, where the entire sample was of 31 observations and the subgroup of large farmers were of 27 observations. The elasticities were slightly higher (in absolute value) for the large farmer's sub-group than the entire sample. Reflecting that the large farmers were relatively more price responsive and income responsive than small farmers. The total price elasticity indicated that the farmers would market more with the increase in prices. The elasticity of marketings was found to be slightly higher than that of Bardhan's estimate (Haessel 1.97 and 1.75, Bardhan 1.78 and 1.60). The elasticity of demand was more in case of entire community than that of large farmers. Thus, it suggested that in non-farmers demand for foodgrains were relatively more price elastic (as the entire community or sample also included non-cultivating families, i.e. traders) than that of large farmers.

Hatfield made an attempt to establish a mathematical relationship between the marketed surplus of paddy and farm size as well as marketable surplus of paddy and the net receipts. The study related to a sample of 150 cultivating households distributed over 15 villages of Hooghly district of West Bengal. The author expressed his views in addition to Raj Krishna's conclusion. Good statistical fitness of a

straight line does not necessarily clarify the existence of a linear functional relationship in the population, for it was best known that any relationship could conveniently be presented by a straight line in a small neighbourhood. Secondly, Raj Krishna had ignored observations like zero and nearly zero values of the gross sale, cutting below from the "X" axis. An exponential functional relationship was shown by the author with marketable surplus and farm size and the other, marketable surplus and net receipt of paddy respectively. For testing the statistical goodness of fit of the functions a separate measure was followed, designated by

\[ \frac{2}{(S - S)} \]

the formula \( D = \frac{2}{(S - S)} \). Where, \( S_0 \) is the observed value of net sale, \( S_e = \) fitted value of net sale, \( S_0 = \) arithmetic mean of \( S \) values. This statistical test was forwarded by Rudra (1970). This second derivative was negative, of the function percentage sales of paddy to net receipt of paddy with respect to farm sizes, indicating that negative value had risen sharply at a decreasing rate until it crossed the X axis at 0.66 hectares. It was argued that holding with farm size of 0.66 hectares or less were below subsistence level, in turn they were obliged to sell their produce only out of distress. The size group between 0.66

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hectares to 1.98 hectares had marketable surplus practically nil. The causation, to the fact that the farms tend to increase their consumption as the farm size increased. These farms were just above the subsistence level. The farms above 1.98 hectares were of commercial nature as the second derivative was positive for the size.

Patnaik adopted the same methodology used by Dharam Narain in 1950-51 to estimate the nature and extent of marketed surplus in the year 1960-61. The findings were that small farmers found to be of considerably smaller in weight, with holdings below 10 hectares contributed only 33 per cent of the total marketable surplus of all size groups. Holdings below 15 acres had 44 per cent of the gross marketable surplus. There was a sharp decline between size group of 20 to 30 acres. Above 30 acres there was some improvement.

This findings were against the study done by Dharam Narain in 1950-51. The size group below 15 acres contributed more than half of the marketable surplus, i.e.: 54 per cent. Size group below 15 acres contributed nearly half of the total marketable surplus (46.5%). This pervessed the hypothesis that "Marketable surplus as a proportion of value declines upto 10-15 acres then it again increases".

The variation in this study was cited on two accounts (a) output data and (b) consumption data. In acreage data, the author as well as Dharam Narain used the same National Sample data as the source. The difference was only due to yield data. The present author had taken three years average from 1954-57 from Farm Management Reports, which explained greater variation. Whereas, Dharam Narain used the yield data from same source but only of the year 1954-55. This resulted in greater yield index in small holdings (220 per cent) in the previous study and relatively small in the later's authors (170 per cent). Also, it was argued, by the author that yield per unit area narrowed down between small and large farms respectively, due to the adoption of new cultivating techniques in large farms.

The consumption figures used by Dharam Narain was from N.S.S. which was overestimated. In fact, the author pointed out that N.S.S. had overestimated the consumption and underestimated the production. Thus, it lead Dharam Narain to arrive at an overall surplus of 22 per cent. The author cited that even All India Rural Credit Survey Committee arrived to the surplus of 35 per cent. This consumption figures was corrected by N.S.S. in the 16th round of 1957. In consumption, the other point was the consumption by landless labourers consisted about one-third of the class and it was taken that they accounted for one-third of the expenditure in
Lastly, which was caused the difference in estimates were of cost of feed to livestock, as the author had taken the livestock feed data from the 11th round of N.S.S. and has pointed out that the livestock has scaled down, due to the improvement in consumption.

Hanumantha Rao and Subba Rao made an attempt to estimate empirically, the losses sustained by the farmers on account of the factors in paddy as (a) spatial differences in prices, (b) seasonal differences in prices and (d) differences in price according to farm size and relative importance of these factors in the total loss.

Average price differential between the villages and the market was negligible in the unirrigated zone and was about 3.6 per cent in the irrigated zone. The largest price differential, (about 6 per cent) related to the flooded zone, which was understandable in view of higher cost of transportation in such areas. It was also interesting to note that the price differential between the village and the market was lowest in the infrastructurally developed villages.

However, it was also noted that where paddy were grown in a year for two or three times, the off-season of one variety may overlap with the post-harvest season of the another, so that the village-market (spatial) price differential might not vary over distant seasons markedly, as when only one crop was grown in a year. The comparable difference between post-harvest and off-season price worked out to be 10.26 per cent in West Godavari district and in West Bengal it varied from 10.7 per cent to 12.6 per cent. In West Godavari district, the differential was around 13 per cent in infrastructurally developed villages and between 15 to 20 per cent in relatively less developed villages. Paddy repurchased as a proportion of the quantity sold declined significantly with the increase in the size of holdings, it is important to note that such repurchases did not exceed 10-12 per cent of output sold even for smallest farms. The time and pattern of repurchases, as well as weighted price of repurchases did not show any systematic relationship with size of farms. However, prices did not vary between agencies except that the sale to the large traders and to the direct consumers seem to fetch slightly high prices. The differential in prices between urban and village money lenders - traders were to the extent of 2.5 per cent. The total loss suffered by the small farmers amounted to 15 per cent of the cash income from marketed surplus.
Satyanarayana et al. (1984) analysed the marketing problem of small farmers of the Gudimellanka village of the east Godavari district of the Andhra Pradesh. The basis of primary data collected from 40 farmers households during April 1979 to March 1980. The authors found the inverse relationship between farm size and marketed surplus and provide on the sale.

Bhalerao and Reddy (1986) attempted to examine the marketed surplus in groundnut by size of farms and to analyse the factors affecting the marketed surplus both in rainfed as well as irrigated groundnut. The analysis revealed that per hectare marketed surplus in case of irrigated groundnut was about 3.75 times more than that of rainfed groundnut. The proportion of marketed to marketable surplus in both the cases showed negative relation on the size of farm. It was observed that there was no distress sale even among small farmers for groundnut since the marketable surplus exceeded.

Marketed surplus in the present study further both for irrigated and rainfed groundnut, volume of groundnut

production per farm and price of groundnut per quintal had a positive impact on marketed surplus, while home consumption of groundnut per farm, quantity of seed used and size of family hold negative impact.

Mishra et al. (1988) attempted to identify the groups of farmers generating the marketable surplus of wheat in the eastern region. They concluded that the marginal and small farmers generated some marketable surplus of wheat which constitute of one-tenth of the total surplus. The rest generated by the medium and large farmers. The inter-farm disposal pattern of wheat showed that marginal farmers in particular go for stress sale and the other categories of farmers showed less than their marketable surplus. They retained some surplus either for seeding or for precautionary purposes.

Reddy, M.J.M. (1990) objectives of the present enquiry are to estimate marketable and marketed surplus, in groundnut by size of farm and to analyse the factor affecting marketable and marketed surplus both in rainfed as well as irrigated groundnut.

The study is based on a two stage stratified random sample of 234 groundnut growers (162 rainfed and 72 irrigated) selected from 9 rainfed groundnut villages in Vayalpad block of Chittor district (Andhra Pradesh) with 6 small farmers (below 2 hectares), 6 medium farmers (2 to 4 hectares) and 6 large farmers (above 4 hectares) per village. Data were collected by survey method for the period from 1 July 1983 to 30 June 1984. Cobb-Douglas function was fitted to data, both for rainfed and irrigated groundnut, for the three size groups and for the pooled data (all size groups together) to study the impact of 7 explanatory variables (namely, groundnut production, home consumption of groundnut, groundnut used as seed, area under groundnut, size of holding, size of family and price of groundnut) on the dependent variable, i.e. quantity of marketable or marketed surplus in groundnut in quintals per farm.

Details of area, production, marketable and marketed surplus for rainfed and irrigated groundnut, per hectare marketed surplus in irrigated groundnut is almost three and three-fourth times than in rainfed ground. In rainfed groundnut, it is highest for medium farms followed by large and small farms, which in irrigated groundnut, it is highest on medium farms followed by small and large farms. Proportion of marketed and marketable surplus exhibits negative relation
with the size of farms.

Per hectare marketable surplus in case of irrigated groundnut is about two and half times that of rainfed groundnut and exhibits positive relation with the size of farm. Further, both for RGF and volume of groundnut production per farm and price of groundnut per quintal have a positive and significant impact on marketable surplus while home consumption of groundnut per farm, quantity of seed used and size of family have negative impact.