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STUDY OF CROP PATTERNS ON AN URBAN FRINGE

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This paper is intended to present a factual study of crop patterns obtained on agricultural holdings lying on the fringe of the city of Nagpur, which is a large urban centre. The background to this study is that in the course of the investigations into the socio-economic life of farmers in the neighbourhood of Nagpur, it became clear that the decisions of the farmers regarding agriculture seem to depend on some special considerations due to their farms being in the proximity of a big city. The ready availability of a good transport system, nearness to the market, opportunities for temporary and permanent employment in non-agricultural occupations for some members of the family, ready demand for perishable agricultural products such as green vegetables, shortage of field labour and its high cost, etc., seemed to be some of the features which distinguish agricultural production on an urban fringe. Further, it may be foreseen that with the economic development of the country the rural parts would gradually lose their isolation and they would bear the same impact of development which areas in proximity to the centres of development are experiencing today. From this point of view, 'urban fringe agriculture' seems to be an institution which needs to be studied and its crop patterns would therefore be of special interest.

Holdings have been selected from the neighbouring areas of Nagpur city on the basis of the best possibility of getting the required information from the cultivators concerned. These holdings may be broadly grouped into the following three categories:—(I) Middle sized holdings of the predominantly *kharif* area to the west of the city, with medium to heavy soil suitable for cotton cultivation; (II) All cultivators belonging to the village Bhilgaon having predominantly *rabi* crops on medium to heavy type of soil; and (III) Market gardeners having well irrigation and having light to medium soils.

Category-I

Crop patterns on ten holdings were studied in 1961-62. The size of the holdings varied between 14.94 acres and 55.10 acres. The average size was 27.57 acres. Table I shows the average area under different crops.

TABLE I—CROP PATTERN

| Crop | Area under the crop (acres) | Percentage to total cropped area |
|--|-----------------------------|----------------------------------|
| Cotton | 46.45 | 19.33 |
| <i>Tur</i> | 10.55 | 4.38 |
| Juar | 87.14 | 36.25 |
| <i>Mung</i> | 8.36 | 3.48 |
| Wheat | 61.40 | 25.55 |
| Miscellaneous | 26.47 | 11.01 |
| Total cropped area | 240.37 | 100.00 |
| Per cent of cropped area to total area | — | 87.23 |

It may be added that the above crops are not sown necessarily alone. Cotton is sown mixed with *tur*, *juar*, *ambadi* and *til* in very small quantities. *Juar* is sown mixed with *tur*, *mung* and *bajra*. Among the *rabi* crops gram and linseed are sown along with wheat. It may generally be observed that the farmers of this category grow anything from 6 to 10 crops in a year. Detailed enquiries showed that they are also engaged in the production of milk and milk products and maintain a few goats and poultry. Thus the aim is to provide for their domestic needs, fodder for cattle and to earn some cash income. Individual enquiries showed that the insistence on growing such a large variety of crops rather than concentrating on some more paying crops was mainly due to fear of a total failure of crops or a bad season. The additional reasons are stated to be various limitations placed in following such a course such as want of capital, difficulty of getting agricultural requisites such as seed, manure and labour supply.

The profit motive and the price factor alone do not shape the crop patterns. In sum, the cultivators of this category seem to select a crop pattern which is indicative of a compromise between the self-sufficing economy of the traditional type and the money economy of today. A careful examination of individual cases showed that the year's crop pattern was largely shaped apart from the natural factors such as soil and rainfall, by the productive means at the disposal of each family and his requirements for home consumption.

Category-II

An enquiry into the cropping pattern of all the holdings in the village Bhilgaon was made with reference to the year 1961-62. The size of holdings ranged from 1 to 63 acres each. The distribution of holdings according to four size groups and the average number of crops grown are shown in Table II.

TABLE II

| Size group of holdings (in acres) | No. of holdings | Average number of crops |
|--------------------------------------|--------------------|----------------------------|
| 1 — 5 | 7 | 2.3 |
| 5 — 10 | 13 | 3.98 |
| 10 — 20 | 14 | 4.30 |
| 20 and above | 15 | 5.15 |
| Total .. | 49 | |

There were about nine crops grown in this village. The number of crops grown seems to have some relation with the size of holding.

It may be noted that larger the size of the holding larger the number of crops grown. The two largest size holdings having 63 and 57.50 acres of land have grown 8 crops each and the two smallest holdings of one acre and two acres each have grown one and two crops respectively. For the group of holdings with five acres each, the growing of four crops appears to be the rule. The holdings in the size group between 10 and 20 acres have grown 5 crops each.

Reasons for Choice of Crops

The decision of the cultivators in growing respective crops may be studied with reference to those crops as follows.

Cotton :—About 5 per cent of the cultivators have grown this crop. Out of the 10 cultivators who have grown it, 8 are the biggest holders of the village, holding land above 20 acres each. Individual enquiries showed that the possession of land suitable for cultivating cotton and the ability to spend the larger cash required for growing it are the reasons which have combined in favour of the decision to grow this crop.

Juar :—About 75 per cent of cultivators have grown this crop and about 18.10 per cent of the cropped area is under it. The cultivators who have not grown it are exactly those who have put their land under wheat. This decision is made because, the lands belonging to these cultivators was found specially good for wheat. Juar is required for home consumption and it supplies fodder to the cattle. This explains the insistence of the cultivators to grow it.

Tur :—This crop has invariably accompanied juar with a few additional cases growing *tur* alone. In all 95 per cent of the cultivators have grown this crop, the land under it being 15.75 per cent. This being an essential article of diet, and in view of the tradition to grow it with juar, it finds a place in the crop pattern in fixed proportion to juar.

Chillies :—About 30 per cent of the cultivators, specially the large holders have grown this crop on field scale. Small holders have not grown it at all. The total area under this crop is 15.75 per cent. Chilly is a cash crop. But there is risk involved in growing it and it requires considerable attention due to susceptibility to disease. The larger holders could undertake the risk involved. There are difficulties in marketing small quantities. Those who do not afford to allot sufficient land to it do not grow it except in small way for domestic consumption.

Brinjals :—These are grown on field scale without the help of irrigation. This is a cash crop and brings in ready money in a short period owing to the vicinity of the market. About 70 per cent of the cultivators have grown the crop in an area of 1 to 2 acres each covering 7.41 per cent of the total area of the village. The biggest holders of the village have 4 to 5 acres each under this crop. Advantage is thus taken of the nearness of market in growing such a highly perishable crop. This practice is an instance of good decision making by taking into account the income prospect.

Wheat :—The land in this village is particularly good for wheat. It is, therefore, seen that except a small minority of 2 per cent of the cultivators all the cultivators are growing wheat and the percentage of the area under this crop in the village is 40.70 per cent. It is interesting to observe that landholders in the smaller size group cover a very high percentage of the area of their holdings under wheat and this percentage tends to be lower as the size of holdings becomes larger. In the size group of holders between 1 to 3 acres anything from 70 to 100 per cent of the area is covered by wheat. In the case of holdings in the size group between 5 to 15 acres, 40 to 70 per cent area is under wheat. In the size

group between 15 to 25 acres 40 to 50 per cent area is under this crop. This ultimately tends to be only between 30 to 40 per cent in the case of the largest holders. The natural conditions are thus seen to supervene in the choice making process.

Lac-Gram-Linseed:—It is seen that lac is grown only by two landholders covering together only 1.50 acres of land. Gram is grown by 20 per cent of the cultivators covering 6.92 per cent of the area under the crop. Holdings below 10 acres do not seem to have grown it at all. The middle size holdings seem to be its principal growers. Individual enquiries showed that the crop appears in green patches during the winter months and attracts attention of men and cattle with consequent danger of loss. Families having proper facilities for watching the crops can only afford to grow it. Linseed is grown by 10 per cent of the holdings and covers 4.89 per cent of the area. The crop seems to have been grown in the main by the large cultivators who could devote 5 to 10 acres under it, in large blocks. Being a commercial crop, there are frequent fluctuations in market prices. Small cultivators do not, therefore, concentrate on it. From the above discussion it appears that greater variety and alternatives in growing crops are availed of by only the bigger holders. The common crop patterns seem to settle into 4 to 5 crops for the middle size holders of which 3 to 4 are grown each year.

Food Crops versus Commercial Crops

Table III shows the variations in the area covered by the above crops in relation to the size of holdings.

TABLE III

| Size group of holdings (in acres) | | | | | Food crops Per cent of area | Commercial crops Per cent of area |
|--------------------------------------|----|----|----|----|--------------------------------|--------------------------------------|
| 0 — 5.00 | .. | .. | .. | .. | 82.24 | 17.76 |
| 5 — 10.00 | .. | .. | .. | .. | 80.68 | 19.32 |
| 10 — 20.00 | .. | .. | .. | .. | 75.73 | 24.27 |
| 20 and above | .. | .. | .. | .. | 52.20 | 47.80 |

From the above table it is seen that with increase in the size of holding the percentage of area under commercial crops increased while that under food crops decreased.

Enquiries also showed that price as an influencing factor behind variations in areas under different crops on a farm did not seem to weigh much except with large holders. Individual enquiries have revealed that socio-economic condition of the cultivating family and patterns of crop, set by long practice seem to be the governing factor in individual cases.

Category-III

Group I—Records of six market gardeners having an average area of 25.77 acres showed that each grew the following crops in the year 1959-60. The ave-

rage earnings (gross sales plus value of goods consumed at home) are shown against each in Table IV.

TABLE IV

| Crop | Area in acres | Average earnings per acre in Rs. | No. of farms growing the crops |
|---------------------|---------------|----------------------------------|--------------------------------|
| Juar | 43.80 | 127.73 | 6 |
| Wheat | 16.47 | 127.02 | 3 |
| Paddy | 4.16 | 96.61 | 1 |
| Gram | 0.57 | 126.33 | 1 |
| <i>Tur</i> | 13.11 | 118.18 | 6 |
| <i>Mung</i> | 2.37 | 48.29 | 4 |
| Linseed | 0.57 | 128.33 | 1 |
| Cotton | 3.17 | 88.74 | 3 |
| Vegetables | 2.39 | 399.66 | 3 |
| <i>Arum</i> | 0.40 | 754.90 | 1 |
| Orange | 11.40 | 1,090.09 | 4 |
| Sugarcane | 0.88 | 1,491.50 | 1 |

All the above farms are irrigated. Table IV shows the diversity in the crop pattern followed by the market gardeners who have grown not only money crops but have also combined with it open field cultivation of subsistence crops. This is evident from the fact that all the six farmers have grown *juar* and *tur*, wherever practicable they have grown wheat and paddy also. The crop-wise level of earning shows that cultivation of sugarcane, orange, *arum* and vegetables has resulted in the best earnings per acre. Reference to individual cases showed that the growing of oranges has been planned by all, but only four of them have practised it so far. Sugarcane and *arum* are the results of individual enterprise and resourcefulness. Thus it is evident that the availability of the necessary facilities and individual initiative are required for the introduction of a novel crop pattern. There are limits to the further spread of high income yielding crops. In the case of orchard crops the availability of water in the summer months sets the maximum limit to which they can be extended.

Group II—This group consists of 13 market gardeners all of whom possess facilities for irrigation. The size of their holdings shows wide variations, *i.e.*, from 2.50 acres to 60 acres, the average size being 16.78. Some field crops are grown both under irrigation and without irrigation. The holdings may be classified as in Table V with reference to their size and the average number of crops grown.

TABLE V

| Size group of holdings (in acres) | No. of holdings | Average Number of crops |
|--------------------------------------|--------------------|----------------------------|
| 1 — 5 | 4 | 1.0 |
| 5 — 10 | 2 | 2.0 |
| 10 — 20 | 3 | 2.5 |
| 20 and above | 4 | 5.2 |

About six crops are grown on these farms. All the vegetables are classed as one crop. A variety of crops are grown by the owners of large holdings. Two of the four holdings with an area of over 20 acres are growing along with irrigated crops, such as orange and vegetables, cotton and wheat under irrigation.

Area under Different Crops

Table VI shows the proportion of area under different crops for all the holdings.

TABLE VI

| Crop | Percentage area under the crop |
|---------------------------------------|--|
| Orange | 20.10 |
| Vegetables | 21.80 |
| Cotton | 2.16 (Irrigated) 4.64 (Unirrigated) |
| Paddy | 0.34 (Irrigated) 0.64 (Unirrigated) |
| Maize | 0.96 |
| Juar | 22.66 |
| Wheat | 6.01 (Irrigated) |
| Other Crops—Gram and Groundnut.. .. . | 4.21 |
| Fallows | 16.48 |

About 42 per cent of the area in all the holdings is devoted to the growing of orange and vegetables which are under irrigation. The next best is juar with 22.66 per cent area under it which is unirrigated. In this case the tendency to grow minor crops is not observed, but concentration of men and material on growing cash crops to the maximum limit is easily discerned. Table VII shows the proportion of area under oranges and vegetables in the different size-groups of holdings.

TABLE VII

| Size group of holdings (in acres) | Percentage area under Oranges and Vegetables |
|--------------------------------------|---|
| 1 — 5 | 83.45 |
| 5 — 10 | 58.25 |
| 10 — 20 | 81.22 |
| 20 and above. | 22.84 |

It is interesting to note that barring the case of the class interval 10 to 20 which covers only one case, the broad tendency of larger proportion of land being devoted to the growing of high income crops such as oranges and vegetables by the lowest size holders and a gradually descending order in the percentage of land put under these crops on the larger sized holdings is apparent. This indicates how specialization of crops may be practised by small holders for making their farms pay, given the necessary facility of irrigation. The one crop pattern holding in the case of a crop requiring intensive labour may thus offer the best financial prospect. With the unfavourable man-land ratio the agricultural income levels may be improved by supplying the requirements for agriculture of the above nature.

URBANISATION AND CROPPING PATTERN

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The factors that influence the cropping pattern of any particular region are legion. The physical features such as soil and climate, the technical limitations such as drainage and irrigation, the economic influences by way of market mechanism, land tenure, etc., and even the sociological complexities such as any caste taboos, etc., not only affect the cropping pattern but by their interactions with each other, cause variations in cropping pattern. These are the macro-factors; but in a framework of homogeneous extraneous factors, great variations exist from holding to holding and the basis of crop planning on individual holdings is a field for primary research.

This study is a by-product of an *ad hoc* enquiry into the factors influencing cropping pattern in the North and South Arcot Districts of Madras State. The Agricultural Economics Research Centre, University of Madras, conducted this sample survey, as a part of its research programme.