Chapter -II

REVIEW OF LITERATURE

Review of literature presents a vivid picture of the work so far done on the subject and what is who done on the topic under study. There are very few studies conducted on the appraisal of Government Agricultural Farms in India and none in U.P. Such studies are location specific and results are appropriate only for local use. In the absence of literature on the topic of study results of relevant studies conducted on farmers fields have been presented. Review of literature has been categorised as under:

1. Cropping pattern
2. Cropping intensity
3. Irrigation
4. Labour utilization
5. Fertilizer consumption
6. Income distribution

1. CROPPING PATTERN:

Shetty (1970)\(^1\) observed that acreage expansion was most important source of growth of production at all Indian level, the contribution of area and crop pattern accounting for nearly 90.00 per cent of the increase in agriculture production. The contribution of area was also significant in almost all the regions studied with the exception of Punjab where nearly the entire increase in production was accounted for by improvement in yield per acre. Thus, the increase in agricultural production seems to have been realised mainly through

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the expansion of area under crops rather than through improvement in the productivity of land.

Sanoria (1970)² reported that with the increase in size of holding area under high yielding and improved seeds have increased. It was 6.12 per cent in small size group whereas 68-69 per cent in large size group.

Soni (1970)³ concluded that in case of wheat, the pace of adoption of high yielding varieties had been the highest. In 1968-69, out of total area devoted to wheat, 58.0 per cent was under high yielding varieties. In case of other crops, such a ratio was quite low.

Singh and Singh (1975)⁴ reported that on an average, food crops, occupied the largest area, accounting for 85.50 per cent of the total cultivated area followed by cash crops (9.36 per cent). The investment, on an average, came to Rs. 2874.79 per hectare.

Singh and Srivastava (1975)⁵ in a study of small farmers in district Varanasi reported that local and high yielding varieties of paddy occupied the highest area being 29.73 per cent, to the total cropped area followed by local and high yielding wheat (27.93 per cent) and maize (10.81 per cent). The area under high yielding varieties of paddy and wheat together occupied 32.88 per cent to the total cropped area.

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Garg and Pandey (1975) reported that there has been a shift in cropping pattern on small farms with the introduction of S.F.D.A. Programme in district Pratapgarh (U.P.). The local varieties were replaced by the high yielding crop varieties on one hand and the less remunerative crops like Bajra + Arhar in Kharif and Barley in Rabi were replaced by H.Y.V. of Paddy and wheat respectively on the other.

Venkataramanan and Prahaladachar (1980) concluded that in Uttar Pradesh cropping pattern was characterised by dominance of foodgrains throughout the period 1950-75 and relative share of foodgrains declined from 83 to 78 per cent, whereas, oilseeds increased from 11 to 15 per cent. Among the foodgrains, wheat, rice and maize clearly gained the area, while pulses, barley and jowar lost in area. Contributions to the output growth in wheat, rice, oilseeds and sugarcane came both from the growth in area and growth in yield, whereas in the case of maize, the contribution to output growth came solely from its area growth, jowar, barley and pulses recorded negative growth rates, both in area and output.

2. CROPPING INTENSITY:

Studies on H.Y.V. crops (1969) concluded that the intensity of cropping was higher on small farms as compared to other size groups.

Prasad and Chandwani (1970) in a study conducted at Farrukhabad district, U.P. concluded that the intensity of cropping was the highest (298.00

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per cent) on 0-1 hectare size group which gave the highest income of Rs. 412,952 per hectare on the farm economy as a whole. The values of input, output, net income and family labour income showed a decreasing trend with the decrease in the intensity of cropping.

Kapoor and Kahlon (1967)\textsuperscript{10} reported corresponding increase in cropping intensity to the extent of 18.5, 20.5 and 21.07 per cent on small, medium and large farms respectively.

Chawala (1974)\textsuperscript{11} observed that on different average holdings, the cropping intensity increased by 11.30 to 19.8 per cent in 1970-71 over the pre-adoption year (1966-67) and further increased between 5.88 and 11.72 per cent in 1970-71 over the pre-adoption period on the three size groups of farms and it further increased in 1973-74 over 1970-71.

Singh and Srivastava (1975)\textsuperscript{12} reported that the intensity of cropping, on an average, on small farms, came to 148.00 per cent.

Singh et al. (1975)\textsuperscript{13} worked out the 'Economics of small farmers in the context of S.F.D.A. Programme in Fatehpur district, U.P.' and they reported that the cropping intensity on an average, came to 161.42 per cent. It was the highest being 169.84 per cent on 1.00-1.50 hectare size groups and the lowest being 150.88 per cent on the largest size group i.e. 2.5-3.00 hectares.


\textsuperscript{11} Chawala, J.S. "Impact of Green Revolution on employment, earnings and wage rates (A case study in district Amritsar)." Ind. J. Agril. Econ. Vol. XXIX(3) : P. 68.


Singh, Kushwaha and Verma (1980) reported that the intensity of cropping was much higher on beneficiary small and marginal farms being 178.41 and 163.50 per cent, respectively, as against 154.25 and 149.16 per cent on non-beneficiary small and marginal farms, respectively.

A case study on marketable surplus and marketing behaviour of wheat in block Sasni, district Aligarh (U.P.) (1981) reported that the average intensity of cropping on the farmers under study came to 134.20 per cent. It was highest on medium size of holding being 137.29 per cent followed by small and large size of holdings being 135.58 and 131.54 per cent respectively.

Rai (1983) in his Ph.D. thesis "Growth trend of area, production and productivity of oilseed crops in U.P." reported that the cropping intensity of the state as a whole, is increasing and it increased from 122.97 per cent in 1950-51 to 139.09 per cent in 1979-80. This increase was the highest during 1960-61 to 1970-71 decade which came to 7.68 per cent. The rate of increase was a bit slow in 1970-71 to 1979-80 decade and it was 4.98 per cent. A regionwise analysis reveals that increase was the highest in Hill Region during 1960-61 to 1970-71 period and its rate was 4.16 per cent per annum followed by western, central and eastern regions where its rate was 1.12 per cent, 0.33 per cent and 0.21 per cent per annum respectively. Bundelkhand region recorded very slow increase during this period at the rate of 0.10 per cent per annum. Western and Eastern regions improved their rate of increase in cropping intensity during 1970-71 to 1979-80 period and recorded an increase of 0.76 per cent and 0.57 per cent per annum.

Singh (1985) concluded that, on an average, the intensity of cropping came to 145.43 per cent. It was the highest being 161.49 per cent on the largest size group of 4 hectares and above farms. This was due to higher percentage area under irrigation and higher area under double cropping.

Director of Agriculture Statistics and Crop Insurance, U.P. (1993) reported that the intensity of of cropping of U.P. was 142.56 per cent in the year 1987-88. It increased in the year 1990-91 and came to 147.29 per cent.

3. IRRIGATION:

Singh (1978) observed that in the success of any cash crop, irrigation is considered to be an important factor and therefore, management of water available for irrigation assumes great importance.

Singh et al. (1980) in a study entitled, "tubewell irrigation an economic appraisal in U.P. district" reported that the introduction of tubewell irrigation on the sample holdings helped the farmers in shifting the cropping pattern in favour of high yielding crop varieties and cash crops on one hand and raising the cropping intensity on the other.

Lenka (1983) reported that with the introduction of scientific water management, the farmers could take three crops viz., Rice-Wheat-Seasamum/Rice-Mustard-Groundnut from 57 to 73 per cent. By providing field channels, irrigated

area was increased by 13 per cent and cropping intensity by 9 per cent.

Daily News Paper the Statesman (1983) reported that with the efficient water management and optimum use of fertilizers and other inputs, it is also possible to double the present productivity level of 1.34 tonnes of rice per hectare in the next two decades.

Maity (1983) reported that lower yield of wheat, paddy and other crops in India is mainly due to unscientific water management practice. Research result clearly indicates that yield can be increased to a large extent by timely application of proper quantity of irrigation in the root zone with good water management practice.

Taylor and Tantigate (1985) reported that the larger irrigation system in Malaysia tends to produce somewhat higher yields and greater annual cropping intensities than small systems.

Tsuchiya and Kain (1987) reported that the poverty in developing countries can be partly solved by an adequate supply of water for agricultural use through irrigation. The introduction of irrigation, will improve and stabilize yearly rice yield and enable modern inputs to be purchased and will provide an opportunity for the local children to receive higher education, which in turn will result in further increase in productivity.

22. Newspaper the Statesman "Water used for rice crop could be diversified," Study made by the Water Technology Centre of IARI, New Delhi as published in the Newspaper, the Statesman Sept. 13, 1983 at Delhi, p. 9.


24. Taylor, D.C. and Tantigate, K. "Costs and performance of irrigation systems of different sizes, types and locations in Malaysia", In Irrigation Management Research from South East Asia, Newyork, USA, Agricultural Development Council, Inc. 49-66, 1985 (En.14 ref., 4 Fig. 6-abi), World Agril. Econ. 6 Rural Sociology, abstract No. 3272 Vol. 29(6), 1987.

4. LABOUR UTILIZATION:

Gangwar (1970)\textsuperscript{26} studied wheat for U.P. and Punjab and rice for West Bengal based on the data from farm management an N.C.A.E.R. for rice. The total labour utilization per hectare increased from 85 to 160 days between 1954-55 and 1966-67. The operationwise breakup the highest increase for harvesting (from 23 to 36 per cent in total) followed by preparatory tillage (from 25 to 34 per cent). In the case of wheat, for the same period, per hectare labour declined slightly. He attributed the decrease to the net effect of additions to the demand for sowing, manuring and intercultural operations on the one hand and decrease in demand due to mechanisation of irrigation, harvesting and threshing on the other.

Desai, et al. (1970)\textsuperscript{27} on the basis of a study of 176 farms in respect of six important crops in South Saurastra region reveal that improved wheat required less man power than the local one because of the shorter growth period. For all other crops-groundnut, Bajra and cotton improved varieties used more labour.

Sharma, Singh and Gangwar (1974)\textsuperscript{28} observed that the majority of labour force was employed for less than 120 days during the 6 months under reference. About 35 per cent and 60 per cent agricultural workers were under employed in Karnal at Mahindergarh districts respectively.

\textsuperscript{26} Gangwar, A.C. "Inter-Regional Differences in Agricultural labour use, efficiency and wages". Ind. Jour of Agri. Econ.,Vol. XXV No.3 PP.39-45.
Singh and Srivastava (1975) observed that employment of total human labour per farm and per hectare was 1529 and 1066 hours unit respectively of which family labour constituted 71.76 per cent only. It shows that farmers in the study area remained unemployed for the major parts of the year.

Grewal and Singh (1975) in their study examined that, on an average, a farm worker got work hardly for 65 days on the marginal farms and 126 days on the small farms in a year. It was also observed that the majority of the farmers faced problems of adequate employment, non-availability of better breeds of milch cattles and marketing problems.

Singh and Singh (1975) reported that the employment of human labour per hectare in crop production and livestock maintenance came to 1062.62 and 199.11 days respectively.

5. FERTILIZER CONSUMPTION:

Dhillon et al. (1987) reported that for one quintal of wheat grain production, 1.95 kg N, 0.43 kg P$_{205}$ and 3.37 kg K$_{20}$ are required.

Prasad et al. (1988) reported that application of 30 kg P$_{205}$/ha gave significantly more ears/m row length, longer ears and more grain weight in 1985-86. A further increase in the rate of P application from 30 to 60 kg


P$_2$O$_5$/ha gave an additional increase in the number of ears/m row length and ear length only in 1985-86.

Thakur et al. (1992)$^{34}$ reported that the highest yield of maize (42.40 q/ha), was obtained at 180 kg N$_2$ : 60 kg P$_2$O$_5$/ha which more than double of that obtained without fertilizer application. This study made in Una district of Himachal Pradesh.

Mishra and Pant (1992)$^{35}$ reported that yield of lentil 25 to 30 quintals per hectare were obtained with the use of 20-30 kg N$_2$, 50-70 kg P$_2$O$_5$ and 40-60 kg K$_2$O per hectare similarly in case of pea and gram yield were obtained 20-25 and 25-30 quintals per hectare respectively with the use of 20-25 kg N$_2$, 50-60 kg P$_2$O$_5$ and 40-50 kg K$_2$O and 20-30 kg N$_2$, 50-75 kg P$_2$O$_5$ and 40-60 kg K$_2$O per hectare, respectively.

Kumar (1993)$^{36}$ reported that the application of 100 kg nitrogen, 50 kg phosphorus and 30 kg potash per hectare in wheat crop of Sitapur district gave 4.4 tonnes per hectare yield in farmers field. In Faizabad district application of 80 kg N$_2$, 20 kg P$_2$O$_5$ and 30 kg K$_2$O per hectare gave 4.5 tonnes per hectare yield in farmers field. In case of rice crops of Sultanpur district, application of 80 kg N$_2$, 60 kg P$_2$O$_5$ and 30 kg K$_2$O per hectare gave 4.00 tonnes per hectare yield on farmers field. This study is based on soil test.

Chauhan and Ram (1993)$^{37}$ concluded that maximum yield of grain


and straw was obtained with the application of 120 Kg N + 60 Kg P₂O₅/ha. The additional amount of nitrogen and phosphorus is not necessary for the better production of wheat under partially up to normal level of fertilizer application and declined there after.

Narang, Mahal and Gill (1987-88) concluded that seed yield of toria increased significantly up to 120 Kg N₂ per hectare (response 6-7 Kg seed/Kg N₂ and production efficiency 21-24 Kg seed/Kg N₂), increase in seed yield with the last increment of 30 Kg from 90-120 Kg N₂ per hectare was 1.3 q per hectare with marginal returns of 5 to 6 times. Toria did respond to phosphorus at 60 Kg per hectare significantly higher than phosphorus 20 and phosphorus 0 and at per with phosphorus 40.

Borude, Patil and Gumaste (1994) concluded that per hectare use of Nitrogen between 37.50 Kg to 115.00 Kg to different varities. The overall use of N₂ was 75.89 Kg. Regarding use of P₂O₅; it was in the range of 6.25 Kg to 37.50 Kg. The use of potash also varied from 6.25 Kg to 37.50 Kg. The overall per hectare use of both P₂O₅ and potash was 11.30 Kg only.

Sharma (1994) reported that rice, in-variably, responded to 60 to 100 Kg N₂ and 30 to 65 Kg P₂O₅. Laskar et al. reported that while both Amā and Boro rice responded up to 100 Kg N₂ per hectare in Tripura, no increase in yield was found in case of local varieties beyond 60 Kg N₂/ha. The requirement of P₂O₅ was 40 Kg per hectare for optimum yields of rice. Laskar et al. reported

that in case of high yielding varieties of wheat, the response in Tripura was found upto 100 Kg N\textsubscript{2} and 50 Kg P\textsubscript{2}O\textsubscript{5} per hectare.

Results obtained in All India Coordinated Agronomic Research Project showed that both lentil and pea gave significant increase in yield upto 25 Kg N\textsubscript{2} and 40 Kg P\textsubscript{2}O\textsubscript{5} per hectare. Response of green gram and black gram has been observed to vary between 25 and 50 Kg for N\textsubscript{2} and 30 to 60 Kg per hectare for P\textsubscript{2}O\textsubscript{5}. The mustard gave response upto 60 Kg N\textsubscript{2} and 40 Kg P\textsubscript{2}O\textsubscript{5} per hectare. The response of groundnut to N\textsubscript{2} and P\textsubscript{2}O\textsubscript{5} has been observed upto 40 Kg and 50 Kg per hectare respectively.

6. INCOME DISTRIBUTION:

Bal and Singh (1970)\textsuperscript{41} in their study on income distribution in rural areas worked out the average income at Rs. 9412.11, Rs. 1763.00 per household, for farm families, labour families and non-farm families, respectively for 1967-68. These incomes for the respective families increased to Rs. 10616.44, Rs. 2032.21 and Rs. 3689.07 in 1968-69. During 1967-68 about 30.00 per cent of the farm families had annual income of about Rs. 10000.00 while proportion of such families in 1968-69 was about 41.00 per cent.

Garg and others (1970)\textsuperscript{42} concluded that by adopting the high yielding varieties programme, the additional income per hectare accounted for more than double of expenses. As regards the pattern of income distribution during 1968-69 on an average, 39.61 per cent was invested on crop production, 5.29 per cent on farm assets, making a total investment on farm production of the order


of 44.90 per cent. The remaining 55.10 per cent was spent on either consumption or savings.

Shah and Agrawal (1970)\textsuperscript{43} studied disparities between 120 progressive and 91 less progressive farms of Badaun district, U.P. They observed that income disparities widened between the two types of farmers (Progressive and less progressive) and between the size groups of farmers within each type due to the impact of new technology. Gross income on progressive farms, from all sources was Rs. 20323, Rs. 11236 and Rs. 22180 on small medium and large farms, respectively while gross income on corresponding size groups for less progressive farms was Rs. 2322, Rs. 3064 and Rs. 5825.

Singh (1976)\textsuperscript{44} in a study in an agricultural progressive area of Purnea district in North Bihar during 1971-72, concluded that an average cultivator earned an income of Rs. 4356.72 during a year. The income earned during a year varied from Rs. 2420.00 on small holdings to Rs. 18223.00 on large size holdings (15 and above hectares). The major source of income was agriculture. The small cultivators earned relatively more from nonagricultural sources, while the large farmers earned more from agricultural sources. The distribution of income showed than on an average, 5 per cent of the households accounted for 15.29 per cent of the total income, while 2.67 per cent accounted for 13.63 per cent and remaining 55.33 per cent had 71.13 per cent of the total income.

Kumbhar (1977)\textsuperscript{45} in a study in Kota district, Rajasthan reported that


\textsuperscript{44} Singh, R. P. "Income, saving and investment of cultivation in an agricultural progressive area of Purnea district in North Bihar. 1971-72. Agro. Econ. Research Centre, Adhoc Study 16 (9) N.67, PP.40-47.

\textsuperscript{45} Kumbhar, B. L. "Income distribution in different farmers." The Economic Times, March, 29, 1977, PP.5 & 6.
The introduction of High Yielding Varieties has increased the level of income of all the size group of farms, but relatively low percentage share was secured by small farmers in the increased income in 1971-72 over the year 1968-69. The average income received in 1971-72 by the small farmers was Rs. 2528.00 of which 45.48 per cent was obtained through cultivation, whereas, the average income received from all sources by medium and large farmer was Rs. 46.53.00 and Rs. 12617.00 of which 61.00 per cent and 83.22 per cent through cultivation. During the period 1968-69 to 1971-72, the per farm income from cultivation increased by 11.30 per cent, the rise in the case of small farmer was 9.29 per cent as against 50.06 per cent in respect of large farmers.

Garg, et al. (1978) observed that, on an average, a net income of Rs. 970.00 per hectare was obtained on small farms as against Rs. 667.00 on marginal farms.

It may thus, be summarized that most of the economists were of the view that with the increase in the size of holdings, the area under high yielding varieties increased. The pace of adoption of H.Y.V. was found to be the highest in wheat and paddy crops which together occupied the largest area. They were also of the view that there has been a shift in cropping pattern with the introduction of H.Y.V. in the favour of dwarf varieties wheat and paddy. The intensity of cropping was found to be the highest on small farms and with the adoption of H.Y.V. programme. The intensity of cropping has increased considerably. The introduction of tubewell irrigation has helped the farmers in raising the intensity of cropping on one hand and bringing more area under H.Y.V. on the

other. With the increased use of H.Y.V., the utilization of labour and other
critical inputs have gone up. Economists were also of the opinion that with
the adoption of H.Y.V. programme, the income per hectare has gone up.

HYPOTHESES:

On the basis of objectives of the study and the review of literature,
the following hypotheses have been developed.

1. The level of resource use is not the same on farms of different categories.
2. The intensity of cropping, irrigation percentage and fertilizer use
   is higher than the district average.
3. Productivity of the crops on Government farms is higher than the
district average.
4. Labour use on the Govt. farms is higher than the norms fixed by
   the Department of Agriculture.
5. Chicken feed (Chanas percentage) percentage of different crops processed
   is higher than the norms set by the Department of Agriculture.
6. There is no correlation between farm productivity and district productivity,
   productivity of crops and cost of cultivation, cost of cultivation
   and net income, cropping intensity and profit and irrigation percentage
   and profit.
7. Productivity of the crops on the farms is lower than the break even
   point.
CATAGORIES OF FARMS

1. GENERAL FARM 132 70.96 2366.14%
2. USAR 19 10.21% 1222.17
3. RAVINOUS 1 0.54% 10.00
4. FLOOD AFFECTED 6 4.31% 147.09
5. PATHARI FARM 5 2.68% 108.00
6. HILL FARM 9 4.84% 57.37
7. UNDULATING AND PROBLEMATIC FARM 12 6.46% 913.93

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