POLICY PAPER 5

SMALL FARMS AND SURPLUS GENERATION - A CASE OF WEST BENGAL

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NATIONAL
CENTRE FOR
AGRICULTURAL ECONOMICS AND
POLICY RESEARCH (I.C.A.R.)

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FOREWORD

Indian agriculture is primarily a small farm sector where more than three-fourths of the country's farm households have an operational holding less than two hectares. The study explores the scope for increasing income on these small farms by following the crop-enterprise mix on the basis of experience of the National Demonstration Project of the ICAR. The study also examines if the small and marginal farms can be made economically sustainable by implementing an optimal farm plan consistent with the availability of resources on these farms. The authors have raised a number of issues related to the small and marginal farms which need to be addressed urgently. Since small farms are a permanent feature of Indian agriculture and can not be done away with, the study points some suggestions for improving their economy. Furthermore, these small farms assume a greater significance and importance in the wake of liberalization of Indian economy.

July, 1995 C.C.Maji

New Delhi Director

1 SUMMARY

Small and marginal farms constitute more than three-fourths of Indian farm holdings. Marginalisation of holdings has been showing a rising trend due to increasing pressure of population on land. Implementation of land reforms has also contributed to this process of marginalisation. The present study conducted in West Bengal where land reforms are better implemented analyses the economic sustainability of the small and marginal farms with different crop-enterprise options. The proportion of the total number of holdings belonging to the marginal and the small categories as well as the percentage of total area operated by these holdings are much higher in West Bengal than those at the national level.

An analysis of the costs and returns associated with the different crop rotations on the small and marginal farms revealed that these were not economically sustainable. The returns consistent with an optimal use of the available resources on the small and marginal farms albeit much higher than the existing levels were also found to be inadequate for economic sustainability. The results showed that the optimal income from an average marginal farm of 0.4 ha was not adequate to keep the farmers above the level of poverty. The situation is slightly better in case of a marginal farm with the maximum land area of 1.0 ha. The position of the small farm, though a little better ,did not present a case of optimism in respect of economic sustainability even with an unconstrained supply of working capital.

The rural people remain tied to agriculture for their livelihood due to the slow rate of expansion of employment in other sectors. Even under the most optimistic assumptions, surplus generation on these farms could not be expected. The situation may worsen further with the swelling in the number of small and marginal farmers and with the resultant decrease in the size of holdings. The study concludes that the small size per se is responsible for lack of economic sustainability irrespective of high yielding technology and intensity of cropping. Important issues emerging from the study such as the need for measures to prevent further marginalisation, the scope of co-operative farming and diversification, the possibilities to encourage on-farm capital formation, faster growth in non-farm sector to absorb agricultural surplus labour and the role of suitable price policy are also discussed.

2 INTRODUCTION

The Indian agricultural policy in the post -independent era displayed two major pre-occupations: first, how to grow more food to meet an ever-increasing demand of a booming population and second, how to ensure farmers more equal access to land resources?

Steps to resolve the first issue culminated in ushering in the Green Revolution of the 1970's. But equity consideration of farmers' access to land was mainly sought to be met from time to time through various land reform measures. Institutional reforms such as abolition of intermediary rights and tenancy reforms were undertaken by various state Governments during the fifties and sixties. Ceilings on land holdings were imposed mainly in the sixties which were again revised in early seventies. However, the pace and extent of land reforms have been uneven across the states due to various socio-political reasons.

While land reforms measures of the Government sought to reduce disparity in land holding, the Green Revolution occurred mainly around resource rich farmers and regions, which in effect widened inter-farm income disparity. Implementation of land reforms in some states, coupled with demographic pressure on account of a higher population growth caused a swelling in the number of small and marginal farmers. Meanwhile the number of and the area operated by the large farmers declined over time. The number of small and marginal farms in India increased from 49.11 million in 1970-71 to 74.63 million in 1985-86 and the national average of operational holding size went down from 2.30 ha in 1970-71 to 1.69 ha in 1985-86.

Decrease in the size of holdings brings about (i) a reduction in the disparity in the distribution of agricultural land and (ii) a more intensive but judicious use of scare farm resource, particularly, land. Thus, it fulfils, at least partly, the socio-economic objective of changing the power structure in rural India in favour of the poor farmers who are more numerous to control the democratic political process and also ensuing efficient use of scarce resources. But the vital question pertaining to the small and the marginal farmers revolves round their economic sustainability.

Various Government documents explicitly acknowledge the increasing pressure on land and the decreasing size of holdings. This trend has several serious implications on the questions of surplus generation and capital formation on the farm for a sustainable agricultural growth. The purpose of the present paper is to explore the micro level realities on small farms, and to see how far they are economically viable in order to sustain themselves and help the process of agricultural development. For this purpose, the possible production alternatives with various crop rotations and joint product principles have been focused on the basis of empirical analysis of costs and returns. The State of West Bengal where, the land reforms have been better implemented and tenants' interests better protected through *Operation Barga* has been selected for this study. The choice of West Bengal has also been dictated by their innate problem of smallness in holding size (0.92 ha) compared to the country as a whole (1.69 ha) for the year 1985-86.

3 PROCESS OF MARGINALISATION

Population in India increased from 361 million in 1951 to an estimated 811.8 million in 1989 and is estimated to exceed one billion by the turn of the century. While the net cropped area remained almost constant at a little over 140 million ha during the period from 1970-71 to 1985-86, the number of farmers increased from 70.49 million in 1979-71 to 97.73 million in 1985-86. During the past four decades, the contribution of agriculture to GNP has declined from nearly 50 per cent to about 30 per cent without any corresponding reduction in the percentage of people engaged in agriculture. The proportion of population engaged in agriculture has come down from about 3/4th to only 2/3rd, revealing that during the past four decades of planned development, India could not adequately develop industries, particularly the household/agro-based small and medium ones and generate adequate employment opportunities to absorb the surplus agricultural workers. Consequently, there has been an excessive pressure of population on land which has accelerated the process of marginalisation of agricultural holdings.

This high rate of growth of population has, in fact, offset the benefits of the Green Revolution. The existing inequalities in the distribution of income in India, by no evidence, could be said to have reduced during the entire period of its planned economic development. The small and marginal farmers, landless agricultural labourers and other weaker sections of the society continue to form the vast majority of the poor who cannot afford to meet even their minimum nutritional requirements. For instance, while food production has increased from 51 million tonnes in 1951 to 171 million tonnes in 1988-89, the per capita availability of foodgrains increased from 395 gms per day in 1951 to only 497 gms per day in 1989 denoting a negligible growth (0.6 per cent per annum).

Table 1 : State-wise number and area of operational holdings of small and marginal Farms.

No. : 000
Area : 000 Ha

State	1970-71		1980-81		1985-86	
	No	Area	No	Area	No	Area
1	2	3	4	5	6	7
Andhra Pradesh	3356 (64)	2618 (19)	5572 (73)	4194 (29)	6175 (75)	4507 (32)
Assam	1587 (81)	1171 (41)	1886 (82)	1331 (43)	1997 (83)	1361 (43)
Bihar	5976 (79)	3408 (30)	9739 (87)	4599 (42)	10404 (88)	4601 (45)
Gujarat	1043 (43)	981 (10)	1346 (46)	1306 (13)	1532 (49)	1489 (15)
Haryana	423 (46)	371 (11)	520 (51)	476 (13)	767 (57)	612 (16)
Karnataka	1921 (54)	1770 (16)	2546 (59)	2276 (19)	3085 (63)	2754 (23)
Madhya Pradesh	2574 (49)	2035 (10)	3329 (52)	2722 (12)	4346 (57)	3567 (16)
Maharashtra	2120 (43)	1862 (9)	3581 (52)	3216 (16)	4542 (56)	4335 (20)
Tamil Nadu	4235 (80)	2899 (38)	6224 (87)	3616 (47)	6758 (88)	3790 (49)
Uttar Pradesh	13142 (84)	7605 (42)	15470 (87)	8678 (48)	16746 (88)	9108 (52)
Kerala	2666 (94)	917 (57)	4018 (96)	1148 (64)	4755 (97)	1186 (68)
Manipur	67 (83)	58 (63)	113 (83)	100 (59)	115 (82)	103 (59)
Meghalaya	107 (71)	116 (46)	110 (65)	100 (34)	110 (64)	100 (33)
Nagaland	25 (27)	26 (5)	30 (26)	31 (4)	27 (21)	27 (3)
Orissa	2596 (76)	2484 (39)	2449 (74)	2012 (38)	2778 (77)	2192 (42)
Tripura	221 (88)	136 (53)	272 (88)	195 (59)	281 (90)	221 (69)
Himachal Pradesh	478 (78)	312 (34)	493 (77)	346 (35)	618 (82)	424 (43)
Punjab	778 (57)	597 (15)	396 (39)	399 (10)	464 (43)	450 (11)
Rajasthan	1631 (44)	1463 (7)	2195 (49)	1904 (10)	2285 (48)	1969 (9)
West Bengal	3470 (82)	2391 (47)	5245 (89)	3353 (60)	5543 (90)	3574 (63)
All India	49632 (70)	33840 (21)	66681 (75)	42737 (26)	74629 (76)	47139 (29)

Note: *Farm size upto 2.0 ha are grouped together under the small and marginal category. Figures in the parentheses indicate percentage of the total number/area.*
Source : *Agricultural Census 1970-71, 1980-81, 1985-86, Govt. of India*

Table 1 gives the state-wise number of and area held by the small and the marginal farmers between 1970-71 and 1985-86. At the national level, the small and the marginal farmers jointly held 29 percent of total area even though they constituted 3/4th of total number of cultivators in 1985-86.

Alongwith the increase in population there has also been an enormous growth in agricultural workforce, particularly, the cultivators. In India, the number of total workers engaged in agricultural occupations increased from 97.2 million in 1951 to 167.2 million in 1981 i.e. by 72 per cent. An excessive pressure of population on land coupled with the existing laws of inheritance and succession, naturally, has resulted in smaller size of holdings.

Table 1 reveals that in some states like Assam, Tamil Nadu, Uttar Pradesh, Manipur, Kerala and West Bengal, the pace of marginalisation of land holdings has been faster than that at the national level. But at the same time, this also implies that in some states, particularly in West Bengal, Kerala, Uttar Pradesh, etc., the access of the small and the marginal farmers to land has increased. It is due to a number of land reform measures, especially abolition of intermediaries and implementation of ceiling laws. In Kerala, for example, 97 percent of farmers who are small and marginal own 68 per cent of land and in West Bengal, 90 per cent of holdings which are small and marginal account for about 63 per cent of land. These two states exhibit a more equitable distribution of land among the farmers compared to the all India pattern.

Size of holdings in West Bengal

The size of holding problem is more acute in West Bengal than in the country as a whole as evident from the decline in the average size of holding. In West Bengal the average holding size has declined from 1.20 ha in 1970-71 to 0.92 ha in 1985-86. The corresponding figures in the country are 2.30 ha and 1.60 ha, respectively. Implementation of various progressive land reform measures by the Government of West Bengal, perhaps have accelerated the process of marginalization of holding size and has certainly resulted in a more egalitarian distribution of land, the traditional source of income and power in rural India. It is worth noting that there are no large farms in West Bengal (except the tea plantations) and that the size distribution of operational holdings has gravitated towards the marginal farms.

Table 2 reveals a comparative picture of the number of operational holdings and area operated by the major size groups in India and West Bengal in 1970-71, 1980-81 and 1985-86.

It shows that, by and large, changes in the size-wise distribution of operational holding and the operational area during the period from 1970-71 to 1985-86 followed a similar trend both in West Bengal and India. However, the proportion of the total number of holdings belonging to the marginal and the small categories as well as the percentage of total area operated by these holdings are much higher in West Bengal than those at the national level. In West Bengal the number of small and marginal holdings constituted 82.3 per cent of the total holdings with 47.3 per cent of the operational area in 1970-71 which increased respectively to 90 percent and 63 percent in 1985-86. On the contrary, the number of small and marginal holdings in the country accounted for 70 percent of the total number of holdings operating only 21 per cent and 29 per cent in 1985-86. It is also observed that there has been 46 per cent increase in the number of operational holdings in West Bengal as against 38.6 per cent in India during one and a half decade since 1970-71. More importantly, the number of marginal and small holdings increased by 73 per cent and 25 per cent respectively, while the area operated by these holdings rose respectively by 67 per cent and 35 per cent in the state during the same period. It is also important to note that both the number of operational holdings and the area operated by other size-groups viz. semi-medium, medium and large holdings, showed a reduction in the country as a whole. An increase in the area operated by marginal holdings in West Bengal from II5th to II3rd of the total operated area during one and a half decade has considerable socio-economic implications and political significance.

Table 2: Number of operational holdings and area operated by major size groups in West Bengal and India

Number in "000
Area in "000 ha

Size Group	Year	West Bengal		India		West Bengal		India	
		Number %		Number %		Area%		Area %	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Marginal (1 ha)	1970-71	2528	60.0	35682	50.6	1089	21.5	14545	9.0
	1980-81	4096	69.7	50122	56.1	620	29.1	19735	12.1
	1985-86	4343	71.0	56748	58.0	1821	32.2	21606	13.2
Small (l-2ha)	1970-71	942	22.3	13432	19.0	1301	25.7	19282	11.9
	1980-81	1149	19.5	16072	18.1	1733	31 .2	23169	14.1
	1985-86	1175	19.2	17881	18.3	1753	31.0	25533	15.5
Semi-medium (2-4ha)	1970-71	558	13.2	10681	15.2	1465	28.9	29999	18.5
	1980-81	519	8.8	12455	14 .0	1403	25 .2	34645	21.2
	1985-86	516	8.4	13254	13.5	1382	24.4	36579	22.3
Medium (4-10ha)	1970-71	184	4.3	7932	11.3	973	19.2	48234	29.7
	1980-81	112	1.9	8068	9.1	595	10.7	48543	29.6
	1985-86	94	1.6	7920	8.1	486	8.6	47008	28.6
Large (l0 ha)	1970-71	3.6	0.08	2766	3.9	231	4.5	50064	30.9
	1980-81	1.4	0.02	2166	2.4	203	3.6	37705	23.0
	1985-86	1.3	0.02	1929	1.9	200	3.5	33187	20.2
Total	**1970-71**	**4216**	**100.0**	**70493**	**100.0**	**5061**	**100.01**	**62124**	**100.0**
	1980-81	**5877**	**100.0**	**88883**	**100.0**	**5555**	**100.01**	**63797**	**100.0**
	1985-86	**6154**	**100.0**	**97731**	**100.0**	**5644**	**100.01**	**63193**	**100.0**

Source : *All India reports on Agricultural Census, 1970-71, 1980-81 and Agricultural Statistics at a glance, February 1990, Department of Agriculture and Co-operation, Ministry of Agriculture, Govt. of India.*

4 COST AND RETURNS OF MAJOR CROPS

The question of economic sustainability of the marginal and small farms has been examined in the objective reality of farm income in West Bengal. The costs and returns of some important crops are computed from empirical data for the year 1988-89 from a random sample of 240 farms in West Bengal belonging to three size groups, namely, marginal (less than 1.0 ha), small (between 1.0 and 2.0 ha) and others (above 2.0 ha) and the economic sustainability of the small and marginal farms is examined with the help of these costs and returns. The total cost (excluding the imputed costs of family labour), gross return, net return (gross return minus total cost) and return per rupee spent on inputs have been worked out using field data. The principal crops of the state kharif rice (local), kharif rice (HYV), potato, wheat, mustard and rabi rice (boro) have been included in this exercise. Income from "non-farm" activities is not considered in this study since our primary survey reveals an absence of such activities in general on this category of farms that merit mention as a source of income.

Table 3 gives the total cost, gross return per hectare, net return per hectare and net return per rupee by crops and size groups mentioned above. It may be seen that the net return per ha of potato is the highest (Rs.5165) followed by mustard (Rs.3296), rabi rice (Rs.2879) HYV kharif nee (Rs.1884) and wheat (Rs.766). However, in case of potato, the amount of operating costs required to generate the net return is also very high (Rs.7092) which limits the extent of its cultivation on small and marginal farms. The total costs of cultivation per ha of rabi rice, wheat, mustard HYV kharif rice, and local kharif rice are Rs.2439, Rs.1962, Rs.1510, Rs.2382 and Rs.1679 respectively. Table 3 also reveals that the average net return per rupee is the highest in mustard (Rs.2.63) followed by rabi rice (Rs.1.20), local kharif rice (Rs.1.12), HYV kharif rice (Rs.1.05) potato (Rs.0.84) and wheat (Rs.0.49). The lowest cost of its cultivation, a high net return (next only to potato), and the highest return on working capital provide some explanations for the rapid growth of mustard in West Bengal where 90 per cent of farms are of small and marginal size. As already mentioned, potato cannot be grown on an extensive scale by the small and the marginal farmers simply because of its high cost of cultivation, more dependence on hired labour and a relatively lower return on investment in working capital.

Table 3: Average Cost and Returns of Principal Crops (1988-89)

Size Group	Total Cost (Rs./ha)	Gross Return (Rs./ha)	Net Return (Rs./ha)	Net Return per Rupee of cost
1	2	3	4=(3-2)	
Potato				
Marginal	7062	13595	6533	0.99
Small	7108	11476	4368	0.74
Others	7062	13904	6842	1.05
Average	7092	12257	5165	0.84
Wheat				
Marginal	1982	2273	291	0.35
Small	1927	2849	921	0.57
Others	2141	2741	600	0.26
Average	1962	2728	766	0.49
Rabi Rice (boro)				
Marginal	2461	5185	2724	1.22
Small	2273	4915	2642	1.15
Others	3318	7757	4439	1.44
Average	2439	5318	2879	1.20
Mustard				
Marginal	1649	4300	2651	2.19
Small	1469	4816	3347	2.74
Others	1502	5024	3522	2.74
Average	1510	4726	3216	2.63
Kharif Rice (local)				
Marginal	1472	3213	1741	1.18
Small	1648	3647	1999	1.21
Others	1925	3653	1728	0.89
Average	1679	3563	1884	1.12
Kharif Rice (HYV)				
Marginal	2073	4553	2480	1.17
Small	2485	4879	2394	0.96
Others	2510	5062	2552	1.01
Average	2382	4893	2511	1.05

Note: *Total cost includes costs on purchased and own inputs at the current rriarket prices during 1988-89 but does not include imputed cost of family labour.*

Even under the assumption of lack of constraint on the availability of working capital, irrigation and marketing facilities, a marginal farmer with one hectare of land (which is the upper bound of land holding of a marginal farmer) can generate a total net return of Rs.9013 provided he grows high-yielding kharif rice followed by potato on the entire area implying 200 percent cropping intensity. Similarly, a small farmer with the maximum area of two hectares of land can earn a net return of Rs.13524 following the same crop rotation. However, this is not a feasible crop plan as the working capital required for implementing this are Rs.9135 for the marginal farm and Rs.19186 for the small farm, which are not really available in most of the cases. Moreover, Table 3 shows the potential income of a small or marginal farmer under extremely optimistic assumptions. The average size of holding of a marginal and small farm in West Bengal is around 0.4 hectare and 1.4 hectare respectively. Hence the annual net income of average marginal and small farmers, following the most profitable crop rotations with 200 per cent cropping intensity, would be Rs.3605 and Rs.9467 respectively, requiring Rs.3654 and Rs.13430 as working capital.

A more reasonable and pragmatic crop rotation consistent with the available resources of the small and marginal farmers, particularly the working capital, is high-yielding kharif rice followed by either mustard or rabi rice. The high-value and value-added crops and enterprises are considered infeasible on these farms since most of these commodities are highly perishable and could not be grown without a well-developed credit, marketing and organisational network. The net returns expected on an irrigated marginal farm of one hectare size, growing high-yielding kharif rice followed either by mustard or rabi rice, are Rs.5131 and Rs.5204 respectively, with 200 per cent cropping intensity. However, the net returns from these crop rotations would respectively be Rs.2052 or Rs.2081 on an average marginal farm of 0.4 hectare. Similarly, an irrigated small farm of 2.0 ha following the same crop rotations i.e. high-yielding kharif rice followed either by mustard or rabi rice, would receive an annual net return of Rs.8037 and 7050 respectively, under the existing technology, infrastructure and resource management situations with 200 per cent cropping intensity. It does not require great wisdom to realise that these returns are too inadequate for economic sustainability of the small and the marginal farmers.

5 OPTIMAL PLAN FOR SMALL AND MARGINAL FARMS

A large body of farm management studies show that, given the present level of technology, available resources and the prices of inputs and outputs, it is possible to appreciably increase income and employment opportunities on the farm by an optimal allocation of the scarce resources among alternative uses. Therefore, the scope for increasing income and employment in the short-run on the marginal and the small farms by developing optimal plans consistent with, among other things, the available resources, has been explored. Besides, the impact of an increased supply of working capital, an input to which the small and marginal farms have a limited access, on the income and employment generated by the optimal plan, has also been examined. Four farm sizes viz.(i) average size of marginal farm (0.40 ha); (ii) maximum size of marginal farm (1.0 ha); (iii) average size of small farm (1.40 ha) arid (iv) maximum size of small farm (2.0 ha), are included in this optimisation exercise employing the standard linear programming (L.P) technique.

The L.P. model considered in this study is presented below.

Maximise $Z = \Sigma c_j X_j$

Subject to $\Sigma a_{ij} x_j \leq b_i$ for all i and
>
$x_j \geq 0$

where x_j is the level of jth activity/process (i.e. area under the jth crop, number of dairy cow, etc.)
c_j is the net return per unit of jth activity/process and
b_j is the level of ith resource available.

Two to three activities/ processes have been defined and included in the optimisation model for each of the principal crops grown in West Bengal. In addition, dairy (cross-bred milch cow) and poultry activities have also been included in the model to make it relatively more holistic. As the dairy activity has not normally appeared in the optimal vector it has been 'forced' in one of the models and its impact on income and employment has been analysed. Since there is hardly any saving to be used as working capital on the small and marginal farms the entire requirement of working capital for implementing the optimal plan has been assumed to be met through borrowing which has been included as a decision variable in the optimisation model. Besides, hiring of human labour and purchase of nitrogenous, phosphatic and potassic fertilisers have been considered as decision variables. The decision period used in the model is a month and the planning horizon is a year. An upper bound of labour available for hiring on various sizes of small and marginal farms based on the maximum number actually hired during the peak months has been placed in the monthly labour constraints. Each farm family in the small and marginal categories irrespective of their holding sizes is assumed to have two adult members to work on the farm. Besides, the upper bounds on the availability of working capital used in the respective optimal plan are given in the parentheses of Column 3 in Table 4 against the existing levels of capital shown in the parentheses in Column 4 on these farms.

Table 4 gives the farm size-wise annual optimal and existing returns, the optimal plan and the employment of family as well as hired labour. For example, a marginal farm with its maximum area of 1.0 ha can yield, without dairy, a return of Rs.9056 with an operating cost of Rs.3000 per year if it follows the optimal plan. This return is more than three times the existing return of Rs.2830 which, however, is associated with the currently available working capital of only Rs.710. The optimal income thus obtainable can at best keep the marginal farmer a little above the poverty line at 1988-89 prices and therefore, cannot sustain an average family at the reasonable level of living. Out of a total employment of 510 labour days generated by the optimal plan, only nine labour days have to be hired. Similarly, the optimal return for a (two hectare) small farm is around Rs.12000 which is associated with a working capital requirement of about Rs.3600. The inclusion of dairy in the model has resulted in lower return on marginal farms primarily because of more profitability of crops than dairying on these farms. The optimal returns on small farms with dairy activity are slightly more than those without the activity.

Table 4: Results of optimal use of available resources on small and marginal farms in West Bengal

Farm Size (ha)	With or without Dairy	Return Over Operating Costs (Rs.)		Optimal Plan	Labour Use (labour days)		
		Optimal	Existing		Family	Hired	Total
1	2	3	4	5	6	7	8
0.40	Without Dairy	5129 (1664)	1580 (312)	KVL.38, RVL.38 POL15	26	0	266
1.00	-do-	9056 (3000)	2830 (710)	LKR.2 , HKR.16, KVL.64, MUS.32, RVL.68, POL.15	501	9	510
1.40	-do-	10349 (3415)	3710 (1035)	LKR.24, HKR.42, KVL.74, MUS.93, RVL.17, POL.15	422	30	452
2.00	-do-	12021 (3583)	4765 (1375	LKR.62, HKR.92, KVL.46 MUS.l.0, RRI.78, RVL.22	613	40	653
0.40	With Dairy	4166 (2100)	NA	LKR.17, HKR.01, FOD.20 MUS.21, POL 15 DAI 1	235	0	235
1.00	-do-	8489 (3000)	-do-	LKR.22, HKR.58, FOD.20 MUS.78, RVL.18, RRI.04 DAI 1, POL 15	465	0	465
1.40	-do-	10685 (4000)	-do-	LKR.37, HKR.50, KVL.33, FOD.20, MUS.88, PUL.15 RRI.19, POL 15, DAI 1	630	10	640
2.00	-do-	12289 (4521)	-do-	LKRI.05,HKR.63, KVL.12, FOD.20, MUS.48, RRI.89, RVL.11,POL 15, DAI 1	639	40	679

Note:

1. Operating costs include expenditures on purchased seeds, hired labour, irrigation, plant protection, fertilizers & manures, repayment of borrowed working capital with interest and hiring charges of equipment etc., and hence the optimal returns shown under Col.3 roughly represent farm business income.
2. The existing returns are not truly comparable with the corresponding optimal returns because of significant difference in the availability of working capital under the existing situation and the optimal plan.
3. Area under crop activities is in hectare, poultry and dairy are in number of birds and cross bred milch cow respectively.

LKR = Local kharif rice
RRI = Rabi rice
MUS = Mustard
KVL = Kharif vegetables
DAI = Dairy
FOD = Fodder
HKR = High yielding kharif rice
POL = Poultry
RVL = Rabi vegetables
Figures in the parentheses in Cols.3 and 4 are the amount of working capital/operating costs associated with the returns.
N.A. = Not Applicable as such situation was not present in the sample farms.

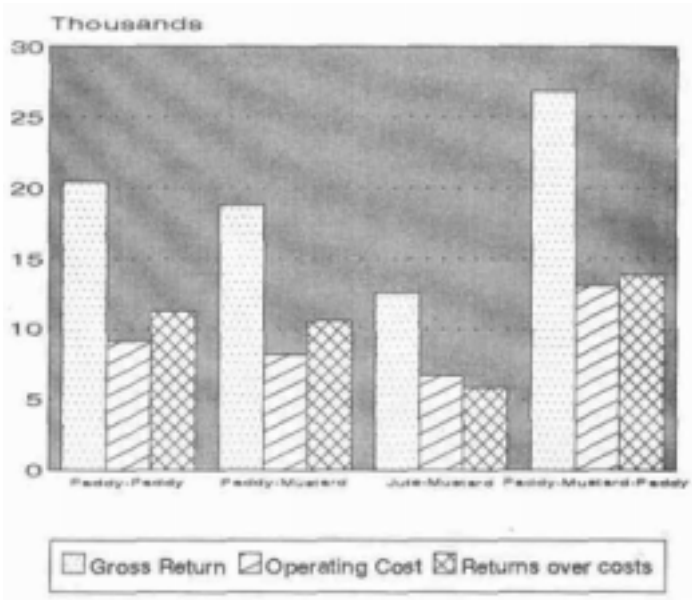
Since land and family labour are virtually fixed in the short run and as the lack of working capital is often found to be one of the most serious constraints to higher production and hence income on the small and the marginal farms, we have assumed a much higher, availability of this critical input in the optimisation model to see if income can be increased on these farms. The results show that even though the optimal income of an average marginal farm of 0.40 ha is more than three times the existing income, it is still not adequate to keep the farmers above the level of poverty. The situation is slightly better in case of a marginal farm with the maximum land area of 1.0 ha. Although the position of the small farms is still better, it does not, however, present a case for optimism in respect of economic sustainability even with unconstrained supply of working capital.

Employment for nearly one-third of the available family labour on an average marginal farm has been generated by the optimal plan which increases with the farm size. It is worth noting here that there has been no need for hired labour to execute the optimal plan on a marginal farm of 0.40 ha as all the labour required for carrying out the activities has been supplied by the farm family. Similarly, family labour has accounted for more than 90 per cent of total labour required on the small farms.

The question as to whether a small or a marginal farm can economically sustain a family of average size has also been examined on the basis of results of two-crop and three-crop rotation using data from National Demonstrations on irrigated lands in West Bengal for 1985-86. It is needless to mention that the primary objectives of the National Demonstration Project (NDP) are to demonstrate to the farmers the genetic production potentialities of major crops per unit area and unit time and also to determine income and employment generation potential of the crops under the most modern technology and crop-rotation best suited to the specific agro-climatic zone.

Table 5 shows gross returns, operating costs and returns over operating costs for various two-crop and three-crop rotations in both the districts of Hooghly and 24-Parganas (North) in 1985-86. Among the two-crop rotations the average return over operating costs per hectare ranged from Rs.5833 in jute-mustard rotation to Rs.11229 in paddy- paddy- rotation with corresponding operating costs of Rs.6729 and Rs.9149, respectively. The three-crop rotations of paddy-mustard-paddy was found to yield a return of Rs.13851 per hectare over the operating costs. (Figure 1)

Figure 1: Result of National Demonstration with Two-Crop and Three-Crop Rotation on Irrigated Lands in West Bengal (Average Value for the two districts Hoogly and 24-Parganas)



The requirement of operating costs per ha to follow the technical recommendations (package of practices) of the two-crop and the three-crop rotations is very high and out of reach of the resource-poor farmers with small and marginal holdings. This implies that the potential returns will most likely be unrealised for want of adequate resources, particularly, working capital. Further, the gross returns and operating costs and consequently the returns over operating costs in Hooghly and 24-Parganas are at great variance for the same rotations (Table 5) even though the soil and other agro-climatic conditions and socio-economic situation are more or less similar in these two districts.

Table 5 : Results of National Demonstration with two-crop and three-crop rotations on irrigated lands in West Bengal.

Cropping-Pattern	Gross Return	Operating Cost	Returns over costs
1	2	3	4
Paddy-Paddy			
Hoogly	21969	7213	14756
24-Parganas	18928	11086	7842
Average	20448	9149	11299
Paddy-Mustard			
Hoogly	20362	5821	14541
24-Parganas	17152	10542	6610
Average	18757	8181	10576
Jute-Mustard			
Hoogly	14354	5586	8768
24-Parganas	10770	7873	2897
Average	12562	6729	5833
Paddy-Mustard-Paddy			
Hoogly	29790	9075	20717
24-Parganas	24003	17018	6985
Average	26896	13045	13851

Source: *Annual Report on National Demonstration Project, 1985-86, Indian Council of Agricultural Research, New Delhi.*

Implicit in the National Demonstrations involving two-crop and three-crop rotation is an intensive cultivation using higher dose of fertilisers, plant protection chemicals and more irrigation which, in the long run, may lead to degradation of non-renewable resources, especially soil and water with consequent imbalance in ecology and environment. Furthermore, there is a great risk inherent in three-crop rotation involving paddy-mustard-paddy in West Bengal. Specifically, the entire crop of summer paddy may get damaged at the time of harvesting by the early monsoon / pre-monsoon rains, thunderstorm and other natural calamities if its' transplantation is delayed due to late harvest of the mustard crop. Marginal and small farmers are economically too vulnerable to bear such a risk in a three-crop rotation. Besides, intensive cropping with the help of 'chemical' technology may result in undesirable ecological consequences and make the production system unsustainable.

Marginalisation of agricultural holdings could be prevented by reducing the pressure of population on agriculture through generation of employment in non-farm sector at a rate sufficient to absorb the excess labour force in agriculture. The facts, however, reveal a completely disappointing picture.

As Table 6 indicates, the percentage of working population in India has marginally increased from 31.81 in 1971 to 32.47 in 1981. In West Bengal the percentage of working population increased from 28.0 to 28.2 during this period. The percentage, of cultivators for the country as a whole has however marginally declined from 13.70 per cent in 1971 to 13.50 per cent in 1981, although, in absolute terms, the number has increased from 75.1 million to 92.5 million during the same period. Similarly, in

West Bengal, the percentage of cultivators declined from 9.0 to 8.42, though their number increased from 4.0 million to 4.6 million.

It is also depressing to note that the rate of expansion of employment in sectors other than agriculture has been extremely slow which, in effect, compels rural people to remain tied to agricultural activities. Therefore, under the existing circumstances there seems to be little scope for a higher rate of labour absorption in non-agricultural sectors in absence of a conscious intervention and policy thrust by the Government in that direction.

If the present trend of declining farm size and swelling in the rank of marginal and small farmers continues, the country may reach a situation where individual farms may become more 'efficient' in terms of yield per hectare, but the farmers would not be able to survive the economic hardship what to speak of surplus generation. These farms will be operating below the subsistence level even under modern technology, unless there is scope for diversified economic growth, enabling the small fanners to participate in various farm and non-farm activities in symbiotic and synergistic manners.

Table 6 : Distribution of Workforce in West Bengal and India during 1971 and 1981

(Number : million)

Population		All workers		Cultivators		Agricultural Labourers		Other Allied activities		Other	
1971	**1981**	**1971**	**1981**	**1971**	**1981**	**1971**	**1981**	**1971**	**1981**	**1971**	**1981**
West Bengal											
44.3	54.6	12.4 (28.0)	15.4 (28.2)	4.0 (9.0)	4.6 (8.42)	3.3 (7.45)	3.9 (7.14)	NA	0.5 (0.91)	5.1 (11.51)	6.5 (11.90)
All India											
548.2	685.2	174.4 (31.81)	222.5 (32.47)	75.1 (13.70)	92.5 (13.50)	47.0 (8.57)	55.5 (8.10)	NA	4.8 (0.7)	52.3 (9.54)	69.5 (10.14)

Note : *The figures in the parentheses denote percentages of the respective categories to population.*

Source:

1. *Agricultural Statistical Compendium by P.C. Bansil pp 174-175, 1990*
2. *Census of India, 1981, Series I India Part H B (i)*

6 EMERGING ISSUES AND CONCLUSIONS

The foregoing analysis makes it clear that small and marginal farms in general and marginal farms in particular are not economically sustainable units of production even under the most optimistic assumptions and an expectation of surplus generation would be belied by this section of farmers who constitute more than 3/4th of the farming community of the country.

In fact, the following issues need to be resolved. First, what should be the future structure and size of farms that ensure economic sustainability? Specifically, is a legally enforceable "floor" like the ceiling on holding size necessary to achieve the goal of economic sustainability and to prevent the farm size from falling indefinitely? Does a periodic reduction in the ceiling on holding size, however socially desirable and politically expedient it may appear, offer any long-term solution to economic problems faced by the small and marginal farmers? Is it legally feasible and politically tenable to bring all marginal and small farmers under the fold of co-operatives with statutory provisions and some amount of compulsion? The earlier efforts by the Government such as Small Farmers Development Agency (SFDA), Marginal Farmers and Agricultural Labourers Development Agency (MFAL), etc, intended to assist the small and marginal farmers through bank loans and subsidies could not make the desired impact due to rampant corruption and ineffective implementation of these programmes.

Second, as there is no surplus generated on the marginal and small farms, there is hardly any scope for on-farm capital accumulation. In West Bengal, these farms account for about two-third of the total area of the operated holdings. A reduction in private investment in the marginal and small farms needs to be compensated by an increased investment from industrial and business houses. The situation thus calls for the creation of a favourable investment climate for the private sector in agriculture. The implications of such a move on policies for public investment and finance in agriculture needs to be clearly evaluated. The impact of capital shortage on the financial market also warrants critical study.

Third, the role of agricultural price policy in resource allocation needs re-examination. So far it is considered an instrument to increase farm income and restore inter sectorial terms of trade. How far can it be called size neutral? Can marginal farms really gain, for example, if the minimum support prices of certain commodities are hiked?

Fourth, what proportion of the small and marginal farms are irrigated and have access to credit and marketing institutions to take advantage of the modern technologies as compared to their larger counterparts? What is the extent of diversification possible on these farms to augment employment and income?

Finally, there is no guarantee that the process of decline in the farm size will stop once it reaches the marginal size. The economic and socio-political forces responsible for marginalisation of farm, size will remain operative resulting in the conversion of many marginal farmers to pure wage-earners/landless casual labourers. What would be the probable impact of this rapid increase in the landless labour population on the labour market, especially on the real wage, in view of little or no demand for hired labour on the marginal and small farms? This is a crucial issue since the ability of other sectors of the economy in absorbing the additional labour force displaced from agriculture has remained depressing during the last four decades. Similarly, what effect the economically non-sustainable small and marginal farms do have on the market for agricultural land, especially in the rainfed areas?

The marginal and small farmers may not be able to survive in the long run if they continue to produce traditional foodgrain crops. Of late, there is a growing concern that small farms must

diversify in favour of high value crops. Farmers organisation/co-operative to cater to the needs of marginal and small farms are either absent or inadequate. Steps to initiate and strengthen such institutions would be necessary. There is no denying the fact that market intervention and price support by the Government are a pre-requisite for the diversification and sustainability of small farms and development of infrastructural facilities such as road, transport, storage and processing are essential to make market intervention and price support more effective, particularly for perishable high-value commodities. In addition, R & D efforts would have to be strengthened to evolve appropriate labour intensive technologies, enterprises and cropping systems for small farm diversification.

In the wake of GATT induced agricultural trade liberalisation, the condition of small and marginal farmers may further deteriorate, unless the above mentioned measures are initiated on priority basis, This is particularly true because marginal farmers are net buyers of foodgrains and market led growth may not suffice to provide food and nutritional security to them.

TABLES

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