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Towards Development of Subsistence Farmers: The Need for New Approaches and Strategies*

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I

INTRODUCTION

I deem it a great honour to have been invited to preside over the 53rd Annual Conference of the Indian Society of Agricultural Economics, a professional organisation par excellence in the service of multitudes of Indian farmers. I am grateful for the opportunity to address eminent economists of my tribe on a theme so vital and dear to me from my early days as to grow up on a rice tenant household.[1] I am conscious of your expectation and I will endeavour to fill the bill but I should admit, at this stage, my bias, you will notice in my address, which I can not avoid as it is the moss I had gathered during my long years of association with and professional involvement in rural development. My plea will be, pause for a moment for introspection and studied judgement of ideas and paradigms I am setting out.

In one's professional life there might be a period of satisfaction and expectations from high theories and paradigms learnt in the portals of higher learning, generating beliefs and hopes for solving the intractable issues such as poverty, malnutrition, social turbulence and economic stagnation in the countryside and there could also be debilitating frustration because of their inadequacies to solve the problems. Agrarian reforms, perceptions and paradigms of the high development theory, had sought to offer explanations and solution programmes to these basic rural malaise. After forty years of testing of the development theories, paradigms, ideological hearsay we are back to square one as far as poverty alleviation is concerned. We are advised of new potential for agricultural development and growth through globalisation and integration of agriculture with that of the world economy under the market-friendly environs. Has Indian agriculture been structured and tuned to face the new tasks?[2]

1. The Setting

Indian agriculture is rich in resources but low in productivity. With 2.5 per cent of world surface area, the country cultivates 163 million hectares (mha) which is approximately 12 per cent of the world arable area. There are two monsoons, bright sunshine all-round the year, by which two or more crops are raised in rotation or in mixture; drought and floods occur across the country even in normal years which vary by regions, spreading out the aggregate impact of severe toll in a few years only. Calamitous droughts which had disastrous

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impact on production have been noticed only in six years over a period of hundred years. Currently, 71 mha are under irrigation and, as estimated in the Plan documents, with additional investment and through optimum management of water resources, effective irrigable area could be increased to 148 mha. Cropping and crop systems are dynamic and responsive to technical opportunities and economic stimuli; with breakthrough in crop improvement, short duration, photo-insensitive and fertiliser responsive crop varieties are available now for raising more than one crop in a year. Deeper investigation into critical aspects of agricultural meteorology and intensive research in various dimensions of bio-technology would heighten expectations of higher productivity in responsive dynamic agricultural systems.[3]

Contrariwise, resources per capita are very low due to the closing productive land frontier against increasing population pressure - its density being 253 persons per sq.km, and with an annual growth rate of 2.1 per cent. A perceptible decline in population growth below 2 per cent is not in sight yet. The per capita availability of land for cultivation is down from 0.49 ha (1950) to 0.20 ha (1980) and is likely to diminish further to 0.15 ha (2000 A.D.). As regards irrigation, it is estimated that the groundwater potential will be fully exploited by the end of the nineties and the entire water resource potential will be fully used by the year 2015.

Furthermore, capital accumulation and investment in agriculture, by private and public sectors, have been relatively meagre and inadequate. The share of gross capital formation in agriculture, at current prices, expressed as a share of gross domestic capital formation, was 24 per cent in 1950-51, peaking around 34 per cent during the First Plan period, declined to 14 per cent during 1966-67, fluctuating between 15 and 19 per cent up and until the eighties, and from thereon a declining share is visible during the eighties reaching a low of 9 per cent. On the other hand, income transfers outside agriculture through taxes and discriminatory pricing have been substantial and the barter terms of trade have been tilted against agriculture which has stifled the growth of investment in agriculture, which in turn, slowed down technical change, improvement in productivity and competitive advantage.[4]

With high unemployment, especially of the disguised version, inadequate investment, inappropriate and injurious income policy, and the burgeoning of sectoral burden of residual resident population seeking employment and income, one would, without loss of generality, posit that Indian agriculture is caught in the low productivity trap and more so when the majority of farmers who account for approximately three-fourths of all farms have per capita land of just 0.63 ha, on an average. The overall agricultural productivity fluctuates around 1.5 tonne/ha.

The development paradigm of conventional wisdom assigns triple roles for agriculture in developing economies. They are: (i) providing manpower, wage goods, raw materials as intermediate goods, and investible surpluses, (ii) offering markets for manufactures and specialised services, and intermediate goods for agricultural production, and (iii) earning foreign exchange by export of farm commodities to meet the growing import needs of capital and technology and select consumer goods. Then occurs secular decline in the share of agriculture in gross domestic product (GDP) and work force as growth takes place. These roles essentially reflect inter-sectoral linkages and trade that are likely to change consequent on the new economic policy, including globalisation of the economy. The experience in India shows significant reduction in the share of agriculture (vide Table I) in GDP but does

not conform with the prediction on employment. The share of employment was 73 per cent in 1965 which has decreased marginally since then to only 70 and 67 per cent respectively for the years 1980 and 1990.[5]

TABLE I. SECTORAL SHARE AND GROWTH OF GDP DURING 1951-52-1989-90

(per cent)

1951-52 to 1955-56 (1)	1956-57 to 1960-61 (2)	1961-62 to 1965-66 (3)	1966-67 to 1970-71 (4)	1971-72 to 1975-76 (5)	1976-77 to 1980-81 (6)	1981-82 to 1985-86 (7)	1985-86 to 1989-90 (8)
1. Agriculture							
54.9	51.9	46.6	43.8	42.0	38.8	36.5	32.8
(2.88)	(3.35)	(0.28)	(5.36)	(2.33)	(1.33)	(3.16)	(3.59)
2. Manufacturing							
11.9	28.1	15.8	16.2	17.0	18.0	18.9	20.0
(5.84)	(6.28)	(6.62)	(3.96)	(3.33)	(4.86)	(6.99)	(6.72)
3. Electricity (Water Supply)							
0.4	0.5	0.8	1.1	1.3	1.6	1.8	2.1
(8.68)	(12.0)	(12.84)	(9.54)	(6.83)	(6.91)	(8.41)	(9.6)
4. Construction							
3.4	3.9	4.6	5.3	4.7	4.9	4.6	4.4
(6.8)	(6.0)	(6.83)	(4.39)	(1.47)	(5.11)	(3.36)	(4.06)
5. Hotel and Restaurants							
8.6	9.4	10.5	10.8	11.1	11.9	12.2	12.7
(4.79)	(5.77)	(5.39)	(4.22)	(4.10)	(4.49)	(5.96)	(6.57)
6. Transport, Storage and Communication							
2.5	2.8	3.2	3.5	3.9	4.4	4.8	5.5
(4.38)	(6.99)	(6.27)	(4.72)	(6.54)	(5.78)	(6.81)	(8.04)
7. Finance							
9.2	8.6	8.3	8.2	8.5	8.8	9.0	9.8
(3.12)	(2.83)	(3.31)	(3.54)	(3.61)	(4.56)	(6.39)	(8.27)
Overall growth							
3.61	4.27	2.84	4.66	3.08	3.24	5.06	5.81

Source: Government of India (1992 a, pp. 4-5).

Note: Sectoral shares are expressed as per cent of GDP. Figures in parentheses are annual growth rates, based on GDP series at 1980-81 prices.

A change from the command economy to a market-friendly one would involve a major shake up in our perception of development process. Experiences of developing nations during the first development decade were highly disappointing and disastrous as the 'trickle down' theory and the expectation of all-round development failed miserably exacerbating welfare issues which remain untackled. It had led to the rehash of the assumptions, approaches and ideological underpinning which followed rather reluctantly but the second shock at the collapse of socialist economies had brought compulsions for radically revising the received development doctrines and contrived strategies.

Integration with the global economy raises quite a few critical issues and requires restructuring of domestic economy. With the assumed positive impact of structural changes introduced recently, one would postulate that outward looking policies would lead to better performance of agriculture and industry under competitive market regimes if they are really

competitive and affording. Basic to this approach seems to be the conviction that development and trade strategies under wide range of liberalisation are market-friendly, which would imply that the state by deliberate design provides information, infrastructure, research, health and education, leaving production and marketing with the private sector.[6]

Agriculture is the largest private sector where millions of farmers - small, marginal, medium and large, are employed in the most risky and uncertain economic ventures. The generation of technical information signifies public investment and institutional efforts in research and transfer of technology. Depending on resource availability, relative prices, factor bias and range of substitutability, factor using and factor saving technologies are evolved and made available. The efforts are institution-intensive such that an integrative process of blending options, opportunities and capabilities is set to realise high resource productivity and cost efficiency, and to sharpen the competitive edge of agriculture in trade.

The initial statement that India is rich in resources and poor in productivity emphasises the lack of appropriate institutional efforts to focus on and design for this integrative process, particularly for those in the periphery to participate in mainstream or core activities. Appropriateness implies resource relevance and problem solving.[7] Comparatively, in the world scene, Indian rice productivity is just 40 per cent of Chinese yields, approximately one-third of Korean yields and around 55 per cent of Indonesian yields; for wheat, Indian yields are around half of Chinese and Japanese yields and less than 30 per cent of British productivity. If one could consider investment, technology and productivity, the scenario of low productivity trap becomes visible.

Then there are a few basic questions: In the wider context of the new economic policy and trade liberalisation, what roles should agriculture play in economic development and trade? How it should be shaped and cast in a competitive, efficient and sustainable mould and how should it be geared to escape the low productivity trap? What are the structural changes necessary and sufficient to make agriculture a dynamic progressive sector and what options and opportunities are available in the context of emerging farming scenarios? Finally, what policy implications they have on macroeconomic decisions on taxes, income transfer, interest and inflation, exchange and exports?

In describing development issues and problems we will identify certain strategies relevant to the changing economic environments and specify alternate modes of organisation and types of institution one could feel comfortable with, and the special problems of target group which warrant for greater involvement by the state directly or through non-government organisation (NGO) or both.

2. *The Focus*

The perspectives of agricultural development in the next two decades are summarised by the Planning Commission as in Table II. Resource development warrants technical change with which improved productivity could be achieved through large investment and participation by farmers of all classes. It would, therefore, be necessary to enlist close and interactive participation by all farmers and it could then be hypothesised that the role of the majority of farmers who are small and operate less than 2 ha and who have several resource constraints, and low to zero savings for investment would be critical for agricultural growth.

TABLE II. AGRICULTURAL PERSPECTIVES IN INDIA

Variable (1)	1984-85 (2)	1991-92 (3)	1996-97 (4)	2001-02 (5)	2006-07 (6)
1. Land (mha)					
(i) Net sown area (NSA)	140.9	140.0	141.0	141.0	141.0
(ii) Gross cropped area (GCA)	176.4	182.2	190.6	197.2	203.4
(iii) Cropping intensity	125.0	130.0	135.0	140.0	144.0
(iv) Gross cropped area under foodgrains	126.7	127.0	130.0	132.6	135.8
2. Irrigation (mha)					
(i) Foodgrains	44.2	53.8	62.3	70.2	77.7
(ii) Other than foodgrains	16.3	21.9	27.0	31.8	36.3
(iii) Total	60.5	75.7	89.3	102.0	114.0
3. Fertilisers (million tonnes - mt)					
(i) Foodgrains	6.2	9.4	12.8	16.6	21.0
(ii) Other than foodgrains	2.1	4.1	5.5	7.1	9.0
(iii) Total	8.2	13.5	18.3	23.7	30.0
4. Product-mix					
(i) Cotton (million bales)	8.5	10.5	14.0	18.0	23.0
(ii) Sugarcane (mt)	170.3	235.0	275.0	335.0	408.0
(iii) Foodgrains (mt)	145.5	172.5	210.0	245.0	285.0
(iv) Oilseeds (mt)	13.0	17.5	23.0	29.0	37.0
5. Population (million)	762.0	844.0	925.0	1,006.0	1,102.0

Source: Government of India (1992 a, p. 32).

Consider a rice monoculture village in a river basin. Poverty reigns large and we ask, soil is good, irrigation is assured and why then productivity is low and people are poor? The wages the landless labourers earn are just enough to feed for half of the year and for the rest they seek employment elsewhere as casuals in road works, along rail track and in general work of all sorts. They remain poor - small farmers, landless labourers and small tenants in all.

There is not much of investment. For cultivation, they borrow, pledging what little jewels they have, hand loans from moneylenders, agricultural loans from co-operatives - all in the descending order of importance. A part of this they spend on purchasing inputs such as seeds, fertilisers and chemicals and another part on consumption, education and other social rituals. Between planting and harvests they suffer poverty, privation and malnourishment; they borrow from traders against the produce pledged for tie-in after harvest sales. Harvests come and joy sparkles at home. Jewels are brought back after redemption of loans; bins are full with freshly dried grains, breathing satisfaction. Cash flows become easy and handy for marriages, pilgrimage, festivals, etc. All is over and gone with off-season. Then crop season starts again with borrowing, toils on lands and so on and so forth. This is a typical farming situation suffering low productivity trap with zero investment, stagnant technologies and unskilled family labour that is under-employed.

Product market is monopolistic/oligopolistic and prices suffer seasonal gluts and buyer's collusion. Farmers are deprived of remunerative prices and income. The scenario of agriculture may be familiar to most of you, perhaps with changes for regional backdrop and realism, it would approximate. The fact of the matter is we have millions of such farm households along with better-off farm households spread across the country.[8]

How the poor could escape the low productivity trap and join the virtuous circle of

prosperity? What are the policy alternatives available and what options one could emphasise and under what conditions? What structural changes are warranted in the context of the new economic policy and globalisation process and what modes of empowerment of this group for their promotion and participation are relevant and efficient? What kind of social protection or safety net one could design? This will be our focus.

3. Resource Base of Indian Agriculture

Natural resource base in conjunction with agro-climatic parameters influences crop patterns and farming systems whose elements include crops - annual and perennials, livestock, fisheries, forests and horticulture. Indian agriculture shows wide spatial variations in crops and livestock activities mainly because of agro-climatic factors. While temporal changes in crop components were not significant, their shares were fluctuating perhaps due to the configuration of socio-economic and inter-personal characteristics and farming systems evolving with time. There have been efforts recently with some success to examine the overall picture of the Indian farming and to delineate farming zones of comparable features of resource base and cropping.[9] For the purpose of agricultural planning, India is divided into 15 agro-climatic zones (ACZ) on the basis of land and water resources, crop production systems, agricultural inputs network and the allied sectors. The zonal specialisation of crops reveals very interesting distribution patterns.

Based on the estimated area-location coefficients, rice turns out to be a major crop in the Eastern Himalayas, mostly Assam, the Lower (West Bengal) and Mid Gangetic Plains (Bihar and partly Uttar Pradesh), and East and West Coast Plains; and, if the rice productivity is also considered, Trans Gangetic Plains (Punjab and Haryana) enter into this group. The Central and Southern Plateaus have high area and yield levels respectively but they do not enter in the estimated zones. Wheat crop is highly localised in the Trans, Upper and Middle Gangetic Plains with the last one having relatively low productivity.

Jowar, mostly grown under rainfed conditions, is concentrated in the Central, West and Southern Plateaus. Higher yields in a limited area suggest the Himalayas and the West Coast Plains whose contribution seem much small. Groundnut cultivation is localised in the Southern Plateau, East Coast and the Gujarat Plains. The other oilseed of importance, rapeseed and mustard, is localised in a number of zones such as the Trans and Upper Gangetic Plains and Rajasthan, besides the Himalayan range; among the commercial crops, jute is grown in the Mid and Lower Gangetic Plains and the Eastern Himalayan regions whereas cotton is concentrated in the Trans Gangetic Plains, West and Southern Plateau and Gujarat Plains; and sugarcane is raised in selective belts of the Middle and Upper Gangetic Plains, Central Plateau and Eastern Coastal Belt.

The regional variations in resource base for a set of select indicators are analysed. Some of the indicators are derived and some are surrogates.[10] The Gangetic Plains have higher irrigated shares and consequently higher fertiliser use levels and number of tractors per unit of GCA; but similar trends are not evident in the case of other variables. Further, tubewells are concentrated in the Coastal regions, Southern and Western Plateaus and also in the Punjab and Haryana States where conjunctive use of water from canals and tubewells is in vogue. The complements, viz., those Zones which have their estimated variables less than that of the national averages, have recorded low levels of irrigation, cropping and fertiliser

use. The Eastern Himalayas indicates poor utilisation of irrigable resource due to inadequate investment and poor management which could be seen also in the trends about tubewells, tractors, fertiliser consumption and per capita bank credit.

II

AGRICULTURAL DEVELOPMENT EXPERIENCE

The four decades of Indian economic development have laid varied emphasis on investment for growth of agriculture. The public sector investment was 10 per cent of the total outlay of the First Five Year Plan, was maximum at 12.9 per cent in the Fourth Plan and was minimum at 5.2 per cent in the Eighth Plan. If the outlays on the complementary sectors such as rural development including land reforms, special area programmes, and irrigation and flood control are included, the share would be between 20 and 24 per cent. The goals and the related development strategies adopted by the Central and State governments are summarised in Tables III, IV and VI.

For the present analysis, the period of four decades of economic development is divided into three distinct periods or milestones of transformation: the first (Extensive Mode)[11] covering the period between 1950-51 and 1964-65, the second (Intensive Mode) between 1965-66 and 1980-81, and the third (Welfare Mode) between 1981-82 and 1989-90. Though the time segments are empirically neat and discernible, conceptually they seem to overlap as one could argue that welfare had been the focus of development all along. Nevertheless, the relative emphasis, supported by welfare oriented programmes, has become evident from the mid-seventies and considering spatial equity, the eighties have distinct mark of concern for welfare.

It may be noted from the matrix, that for each period, agricultural programmes, goals and strategies, and a set of performance indices are provided. The performance index gives the simple percentage change over the period and the change is converted into annual compound rate of growth. There exists a vast literature on trend analysis and estimation of trend-based growth rates and, for the present analysis, however, it is considered sufficient if discrete changes between two points in time are analysed.

1. Extensive Mode

During the first period, economic planning was introduced and for agriculture certain priorities were set, taking into consideration the problems of partition and the fall out of the food crisis management during the war years which had emphasised food production as a top priority in agriculture. Strategies were drawn for development of resources which included land conservation, treatment, and developing land settlements such as Dandakarnya; and also building major multipurpose irrigation systems to support intensive use of land resources. Improved cultivation methods were introduced to maximise the efficiency of use of land and water resources, existing and added. Furthermore, the concern about food security in the context of exploding population and the impending food crisis, as predicted in the Crisis Committee Report,[12] had led to launching very intensive cultivation with massive investment, under Intensive Agricultural District Programme (IADP) and Intensive Agricultural Area Programme (IAAP) in select areas under the most favourable conditions

of irrigation, institutions and infrastructure. Multiple cropping was encouraged in irrigated areas and also in higher rainfall regions with relevant package of practices.

The motivational strategies for rapid adoption of improved technology focused on field demonstration of potential productivity gains, building an efficient extension system responsive to the needs of farmers, particularly of provisioning of inputs nearest to farm gate, subsidised factor prices, interest rates, and remunerative price policy. The Agricultural Prices Commission, Food Corporation of India (FCI), Central and State Warehousing Corporations were some of the institutions built around in support of development efforts and in favour of meaningful participation of farmers.[13]

TABLE III. MATRIX OF AGRICULTURAL PROGRAMMES IN INDIA (1950-51-1964-65)

Goals/Objectives (1)	Strategies/Instruments (2)
Increase foodgrains output, production of industrial and export crops	*Extensive mode:* for resource development: land conservation, reclamation; irrigation projects; afforestation. Intensive modes for output growth: improved seeds, intensive manuring and fertiliser use, timely control of pest and diseases, efficient water management; multiple cropping, Intensive Agricultural District Programme (IADP), Intensive Agricultural Area Programme (IAAP), National Extension Service (NES), High-Yielding Varieties (HYV) Programme. Motivational: remunerative prices, input subsidies and wage regulations.
Infrastructure	Irrigation and power projects, rural electrification, all-weather rural roads, input distribution network, strengthening co-operatives and financial institutions to serve the changing agriculture.
Structural changes	Land reforms: abolition of intermediaries, control and regulation of tenancy relations, land ceiling.
Community and social development	Launching national development project, building comprehensive extension service through Block Development network covering agriculture, health and sanitation, population and welfare, and social services and education.

	NSA (1)	GSA (2)	NIA (3)	GIA (4)	FGP (5)	FGA (6)	SUGP (7)	COTP (8)	GNUTP (9)	FERT (10)	GDP (11)	GDPA (12)
A	16.3	20.7	27.6	36.1	75.8	21.4	113.7	97.7	72.4	845.8	73.8	49.0
B	1.1	1.4	1.8	2.2	4.1	1.4	5.6	5.0	4.0	17.4	4.0	2.9

Source: Government of India (1988 a, b, 1993 a); CMIE (1992).

Note: A = Percentage change over the period.

B = Annual growth rates.

NSA = Net sown area; GSA = Gross sown area; NIA = Net irrigated area; GIA = Gross irrigated area; FGP = Foodgrains production; FGA = Foodgrains area; SUGP = Sugarcane production; COTP = Cotton production; GNUTO = Groundnut production; FERT = Fertilisers; GDP = Gross domestic product; GDPA = Gross domestic products of agriculture.

Infrastructure support to agricultural development process can be classified as physical and institutional: the former includes irrigation and power systems, all-weather rural roads, rural godowns and warehouses and communications whereas the latter is concerned with distribution network for information, inputs and services and about organising research and development. The structural changes through land reforms were introduced, and they included the abolition of Zamindari and other intermediaries, regulation of tenancy relations with respect to tenure, rent and security, wage regulation and land ceiling. Since agriculture is a State subject, the Centre could provide only guidelines, leaving the details of programming and implementation to the states whose involvement seems to have been conditioned by historical and societal predilections along with the emerging power structure, political will, bureaucratic formalism and the power of beneficiary participants.

Furthermore, this period is noted for an innovative attempt by government for a comprehensive development of the rural community and the elements of which are agriculture, social education, health and sanitation. The Community Development Projects (CDP) had created a strong sense of awareness of development and supportive social infrastructures which were to motivate the otherwise estranged segment of the society and for whom development was sought for.

The performance indices indicate the progress of extensive mode of development which could be seen in an increase of 16.3 per cent in NSA and 20.7 per cent in GSA whereas the irrigation area had expanded by 27.6 and 36.1 per cent in NIA and GIA respectively. The impact could be seen in the increase in foodgrains production (by 75.8 per cent) and the significant growth in the output of sugarcane (by 114 per cent), cotton (by 98 per cent) and groundnut (by 72 per cent). Increase in fertiliser consumption with an annual growth rate of 17.4 per cent supports the growth rates elsewhere. The annual growth rate of GDP and GDP agriculture was 4.0 and 2.9 per cent respectively. The share of agriculture in the total GDP had declined from 57 per cent to 48 per cent. May be, the development of infrastructures during the first three quinquennia had laid a strong foundation for the take off in agricultural growth in the subsequent decades and particularly it was the result of planned institution building.

2. Intensive Mode

The second period marks significant output growth and the related problems of prices, income and surplus management. To start with, the first two years suffered adverse weather conditions and the food deficits could be managed only through imports. This experience had shaken off the mood of complacency and an intensive, nationally co-ordinated and imaginative strategy, known as seed-fertiliser or green revolution, was designed to put agriculture on a sustainable orbit, weather god notwithstanding. High-yielding, short duration, photo-insensitive and fertiliser responsive crop varieties, known as modern varieties, of rice and wheat, were imported and adopted, followed by concerted seed research and seed multiplication.

TABLE IV. MATRIX OF AGRICULTURAL PROGRAMMES IN INDIA
(1965-66-1979-80)

Goals/Objectives (1)	Strategies/Instruments (2)
Food security	*Intensive mode:* farming by exploiting seed-fertilisers-water relations, introduction of HYV in a massive way, rapid transfer of technologies and services, efficient use of water.
Regional development	Balanced regional development, Integrated dryland development, Drought-Prone Area Programme (DPAP).
Price stabilisation	Price policy, open market operations to stabilise prices, management of massive food surplus through network of assembling, storage and distribution of foodgrains.
Welfare of weaker sections	Small and marginal farmers' development: Small Farmers' Development Agency (SFDA) Programme, Integrated Rural Development Programme (IRDP) - betterment of artisans, rural women who are economically weak.
Structural change	Land reforms including quick conferment of ownership rights and ceiling on holdings of land and tenancy legislations.
Institutions/ Infrastructure	Indian Council of Agricultural Research (ICAR), State Agricultural Universities (SAUs), Transfer of Technology (TOT), Krishi Vigyan Kendra (KVK).

	NSA (1)	GSA (2)	NIA (3)	GIA (4)	FGP (5)	FGA (6)	SUGP (7)	COTP (8)	GNUTP (9)	FERT (10	GDP (11)	GDPA (12)
A	2.0	7.1	46.0	61.4	51.6	8.8	3.9	27.3	35.4	539.4	58.4	33.1
B	0.1	0.5	2.7	3.5	3.0	0.6	0.3	1.7	2.3	14.2	3.3	2.1

Note: A = Percentage change over the period.
B = Annual growth rates.
Notes and source as in Table III.

There were secondary and tertiary or the second and third generation problems having the impact of output growth on regional and class equity in income/benefits distribution and on their welfare implications for rural population and urban consumers of foodgrains. The question of assets formation in the long run and the critical issue of access to productive assets vis-a-vis participatory development were examined critically by many economists, social anthropologists and political scientists. There have been discernible positions one could take on the impact of technical change and their distributional implications and divergence gap seems closing if one could examine the sequential impact of income and asset formation over a period.[14]

Regional imbalances in income levels and distribution were also noticed. The Plan documents observe that less than 15 per cent of the area under foodgrains had contributed to 56 per cent of the increase in food production during this period. And the maximum increase in regional disparities in per capita income was due to differential progress in agriculture.

The relative prosperity is analysed using the time-series data of per capita state income. Punjab State, having the highest per capita income and the highest crop productivity, was taken as a bench-mark state (100) and per capita income relatives were calculated for each of the 15 selected states for the years 1960-63, 1970-71, 1980-81 and 1990-91 (see Table V).

TABLE V. PER CAPITA INCOME RELATIVES OF DIFFERENT STATES OF INDIA

Sr. No.	State	Select years/periods			
		1960-63	1970-71	1980-81	1990-91
(1)	(2)	(3)	(4)	(5)	(6)
1.	Andhra Pradesh	82.5	55.9	51.3	57.0
2.	Assam	87.3	48.9	44.6	41.4
3.	Bihar	55.6	37.0	32.3	30.7
4.	Gujarat	100.2	73.8	72.5	73.2
5.	Haryana	92.5	85.6	88.1	83.8
6.	Karnataka	77.8	62.3	60.3	57.2
7.	Kerala	72.8	50.7	56.2	46.4
8.	Madhya Pradesh	69.6	47.7	44.0	43.6
9.	Maharashtra	104.2	72.1	90.2	89.5
10.	Orissa	59.9	42.2	45.8	38.4
11.	Punjab	100.0	100.0	100.0	100.0
12.	Rajasthan	71.1	50.0	45.4	48.1
13.	Tamil Nadu	89.0	57.8	55.7	53.5
14.	Uttar Pradesh	62.8	44.3	47.5	40.5
15.	West Bengal	99.5	69.5	58.0	57.4

Source: Government of India (1993 a) and Mahajan (1982).

The ranking of states on the basis of per capita income relatives had not changed much, excepting Punjab which rose to the first rank during the post-green revolution period, Maharashtra sliding to the second rank eventually (1990-91), Gujarat moving to the fourth and West Bengal changing to the fifth rank; and the Spearman rank order correlation coefficient ranging between 0.90 and 0.98, the exception being the period from 1960-63 to 1980-81 with 0.81.

Viewed differently, the inter-state variations, expressed as coefficient of variation, suggest an increasing magnitude of variation which ranged from 18.9 per cent during 1960-63 to 26.8 per cent in 1970-71, 34.9 per cent in 1980-81 and declined to 32.9 per cent in 1990-91. Conscious efforts seem forthcoming from the State and Central Governments to correct the regional imbalances. It is estimated that 70 per cent of the total cultivated area is rainfed which accounts for 42 per cent of foodgrains production in the country. Dryland areas are caught in a vicious circle of high risk, low investment, poor technology and low productivity.

Programmes like Drought-Prone Area Programme (DPAP) for dryland regions, the expanded high-yielding varieties programme (HYVP) to cover new irrigated areas with package of inputs, services and credits reflected the concern for extending the golden circle everywhere. The most significant outcome of the debates and discussions about the prosperity and welfare was the emerging policy framework in support of the weaker sections of the rural sector which included small and marginal farmers, artisans and rural women. Programmes such as Small Farmers' Development Agency (SFDA), IRDP, Marginal Farmers and Agricultural Labourers (MFAL) Agency, National Rural Employment Programme (NREP) and Integrated Rural Energy Programme (IREP) were introduced to generate opportunities for income and employment in agriculture and allied sectors. There was an emphasis to accelerate the process of land reforms by expediting the conferment of ownership rights and enforcing strictly the land ceiling legislation and laws collecting the surplus lands from large farmers.

Performance indicators reveal that during this period, irrigation had been expanding by

46 per cent or at 2.7 per cent per annum and the changes in irrigation intensity had been significant. Foodgrains production increased by 51.6 per cent or by 40 million tonnes. Fertiliser consumption rose by 3.13 million tonnes or by 539 per cent, particularly noteworthy in the context of two fertiliser price hikes at the instance of the Organisation of Petroleum Exporting Countries. The fertiliser response coefficient, according to one estimate, is 14.68:1. The GDP agriculture increased by 33.1 per cent against the overall GDP increase of 58.4 per cent, and in growth terms, 2.1 and 3.3 per cent respectively and the terms of trade had been favourable to agriculture.

3. Welfare Mode

The third period witnessed remarkable activities related to regional and class equity as the overall agricultural growth had shown a sustained trend. The consensus was, first, the gains of growth should be consolidated and its linkage with technology strengthened and, second, such an experience could be transferred to backward regions and to handicapped farms. Regional agricultural research was strengthened under the National Agricultural Research Project (NARP) to solve region-specific problems and facilitate substantial improvements in productivity.

Simultaneously, National Agricultural Extension Project (NAEP) was designed for effective and rapid transfer of technology through reorganisation in the line department, reorienting methods of approach to be more purposive and productive as the Training and Visit (T & V) system and streamlining the dissemination of information through audio-visual media.[15] The National Oilseeds Development Project designed on a mission mode in joint action with National Dairy Development Board (NDDB), was launched and in the course of three years the mission objective of self-sufficiency was in sight.[16] The other programmes were special rice programmes such as Special Rice Production Programme (SRPP), Special Food Production Programme (SFPP) and Intensive Programme for Rice Development (IPRD) for increase in rice production by improving its productivity in low productivity regions.

For the dryland farming system, watershed programme such as National Watershed Development Project for Rainfed Area (NWDPRA) and DPAP with emphasis on water harvesting and development programmes of horticulture, forage and fuel trees and social forestry under the aegis of agro-climatic regional planning were introduced. On employment, a number of approaches were tried and programmes were organised to generate employment opportunities and with the asset creation as a permanent measure of improving the capacity and capability of farmers. Projects like NREP, RLEGP (later combined in JRY), DWCRA and TRYSEM offered employment and skills training. IRDP is target-oriented and it provides subsidised inputs and assets like animals, carts and other farm implements. Minimum Needs Programme (MNP) was to identify and prioritise investment, training and technology for the select 14 sub-projects for comprehensive rural development.[17]

The performance of the agricultural sector was towards consolidation of gains achieved through effective matching of technology and resources with the objective of equity, efficiency and employment, the equity is being realised in terms of distribution of benefit stream and maximum welfare whereas the other two could be achieved through technical and

management improvement. On specific achievements, land resources had registered marginal increase, irrigation (NIA) increased by 20 per cent and foodgrains production by 32 per cent against an increase in area marginally by 0.1 per cent. The commercial crops maintained significant increases in this period also. Fertiliser use was up by 100.8 per cent. The GDP and GDP agriculture had registered a rate of growth of 5.6 and 3.7 per cent respectively and the terms of trade had turned back in favour of the non-agricultural sector.

TABLE VI. MATRIX OF AGRICULTURAL PROGRAMMES IN INDIA
(1980-81-1989-90)

Goals/Objectives (1)	Strategies/Instruments (2)
Consolidate the gains	Set technologies region-specific; horticulture development, problem solving through programmed field contacts, strengthening of regional research, rationalise input delivery systems.
Horticultural development	Social forestry, agro-climatic regional planning.
Extend the coverage to backward regions and to small farmers	Special rice production programme; SRPP, SFPP, IPRD in Eastern States with low productivity, National Watershed Development Programmes, Watershed Development Project for Dryland Areas (WPDA) and DPAP for the rainfed regions
Technical mission in oilseeds	National Oilseeds Development Project, NDDB.
Income	Price policy for income stabilisation, surplus management.
Employment	Opening up opportunities for rural employment through employment projects: NREP, Rural Landless Employment Guarantee Programme (RLEGP), IRDP, Jawahar Rozgar Yojana (JRY), Development of Women and Children in Rural Area (DWCRA), Training Rural Youth for Self-Employment (TRYSEM).
Accelerate land reforms, infrastructure building	Documentation of IREP, JRY, District Rural Development Agency (DRDA), Minimum needs programme (MNP).

	NSA (1)	GSA (2)	NIA (3)	GIA (4)	FGP (5)	FGA (6)	SUGP (7)	COTP (8)	GNUTP (9)	FERT (10)	GDP (11)	GDPA (12)
A	1.9	5.1	19.7	16.3	32.0	0.1	46.3	63.6	61.6	100.8	63.0	38.2
B	0.2	0.6	2.0	1.7	3.1	0.0	4.3	5.6	5.4	8.1	5.6	3.7

Note: A = Percentage change over the period.
B = Annual growth rates.
Notes and source as in Table III.

Summarising the discussion so far about our experience in agricultural developments, we may note:

(i) Land and water resources have shown remarkable progress in achieving physical and quantitative goals and they are found reaching their frontier limits; and consequently, qualitative improvements would have to be effected through management and institutional decisions.

(ii) Seed-fertiliser technology has brought improvement in productivity in quantum jumps but the distribution of benefits are claimed to be skewed. The nominal surplus of 16 million tonnes of foodgrains could not have occurred if income levels were raised either through additional employment opportunities or incremental wage income; or poverty levels

were reduced.

(iii) In spite of the catching up effect over a period in the context of spread and adoption of technology, regional and class differences continue that could be attributed to relatively scarce income, limited investment and technology. This would imply a need for marking specific groups and regions for comprehensive approach for development.

(iv) The approach has been to identify farm, an equivalent of the firm in economics, which has given rise to many misconceptions about farmers' decisions. The need for a comprehensive treatment of production, income, consumption and growth would require integration of farm and home decisions and an understanding of their linkages. The concept of farm household would distinguish farmers from producers in other sectors.

(v) The overall approach to farm problems seems less efficient to reach differentiated farmers, among them those who are on bottom lines are swamped and deprived of the benefits of development interventions. Alternatively, a target group approach with co-ordinated action plan would be cost effective and growth oriented.

(vi) Identification of the target group would require adequate characterisation such that their involvement could be participatory and co-operative.

Based on the six observations modelling of farm households, identification of target group, and policy determination will be attempted.

III

MICROFOUNDATIONS

For policy decisions on development of agriculture, it would perhaps be relevant and necessary to formulate microfoundations of development. One could recall the futility of seeking macro solutions for sectoral growth without firming up the tenets of micro response and behaviour. Therefore, it is proposed to formulate a model of farm household with specifications of decision environments. This is to clarify and set our own understanding of farmers. Then, it would seem necessary to compare the behavioural patterns within farm sector, among classes of farmers. Logically when one thinks of farm problems and policy strategies in a disaggregated level, it would be useful to state and specify the level of disaggregation through a system class stratification. This will be attempted and the target group is identified. Using the decision framework of farm household, parameters of contextual relevance of the target group as an active agent in development process are listed and their relations to income, consumption and growth are specified. Such a discerning approach to agricultural development in the ensuing decades helps to design appropriate strategies for development of agriculture.

1. Farm Household (FHH)

A farm household combines management of farm and home and decides on resource allocation for an optimal and/or feasible activity set, the level of technology to match productivity and/or income efficiency criteria, on retention demand for produced farm commodities and on levels of consumption, saving and investment both with short- and long-term perspectives. Decision-making at the FHH level is mostly a participatory process which provides for active interaction between family members on choice domain and the decisions are arrived by consensus among them. It would be interesting to note that the nature and

degree of participation depend much on relative skills and information they could offer in problem solving. Furthermore, goals are multiple, many faceted and, more importantly, jointly set, however loose the co-ordination with and accommodation of inter-personal variations could be.

The objectives of the FHH are to earn an income to support higher levels of living and to ensure for the growth of farm and home assets for sustaining the realised prosperity over a long period, perhaps the over life-cycle of the head of the FHH. The objectives are broad and uncharted as it would appear but if one notes the emerging pattern of family structure and the nature of convergence of interests of members of the family, one can note a number of options available to the co-ordinator who mediates for a consensus decision, loosely tied with adequate flexibility to meet any contingent situation. The calculus of work and leisure, and worker participation and dependency ratio are very much in evidence in most of the decisions by the FHH.

The decision framework of the FHH during given period could possibly be partitioned into sub-sets of income, consumption and growth which could describe their functional configuration (Table VII). We specify not only production decisions related to resource allocation, enterprise combination, but also processing and marketing for value addition and by which income is realised. The determinants of decisions are discussed briefly.[18]

TABLE VII. DECISION STRUCTURE OF FARM HOUSEHOLDS

Income (1)	Consumption (2)	Growth (3)
Resource allocation	Family size	Capacity augmentation
Land use [O,OT,T]	Consumption unit	Investment in farm productive assets
Land types (Irri./Dry]	Current levels of	
Land treatment	living	Land development
Labour [FL,HL,CL]	Expectations	Irrigation
Machines [O,H]	Wealth and assets generation	Reclamation
		Non-farm assets
Technology		
Factor of production	Consumer durables	Business
[Seed, Feed, Chemicals]	Social expenses	Communication
Factor substitution	Investment plans	Commutation
		Capital accumulation
Finance [O,B]	Saving needs	Human resource development
Enterprise-mix		Education
Products flow		Training
Processing		Health
Packaging		Public decisions:
Marketing		Infrastructure development
Risk management		R & D
Income		Transport
Levels and flow		Communication
		Information

Notes: Owner (O), Owner-cum-tenant (OT), Tenant/share-cropper (T), Family labour (FL), Hired labour (HL), Contract labour (CL). H = Hired, B = Borrowed.

2. *Resource Allocation*

(a) Land use

There are two types of land as irrigated and drylands and there are three classes of operatorship: owner, tenant and a combination of the two. The FHH may have any combination of land use which has close relation with the size of farms inherited or acquired or both, and the land use intensity is completely determined by past investments and current liquidity. Furthermore, there are varying quality of lands identified in terms of gradient, structure and texture of soils and distribution of plots which influence land use decisions. Each of these types is technologically related and requires innovation and investment that are specific to the systems. Land fragments with poor quality, for example, are allocated, with limited investment, to fuel trees, silvipastures and horticultural crops.

The strategies of land use discussed so far are mostly technical and, however, the more relevant and crucial constraints for change are related to economic and management dimensions. They are land tenure, irrigation modes, factor substitution and innovation which together determine the capacity of the FHH for growth and farm development. The macro policy instrument of land tenure at the FHH level is concerned with a wide range of agrarian reforms with reference to ownership and operatorship of farmers, land ceiling, tenancy contract, procedures and their transparency, which are meant to support and motivate the FHH to make rational decisions for high productivity and growth. Land reforms are exogenous and structural and one could examine and explore approaches and methods to endogenise the process such that the FHH decisions are interactive. Technical change holds the key to improve factor productivity by deciding factor bias and substitution and this change could be pervasive if resource availability and management skills are universalised through graded technology to suit different clientele.[19]

(b) Water use

Irrigation entails a land substitution process and becomes limitational in determining the capacity for output growth, and more importantly, in substituting land resource through their increased productivity.[20] Besides reducing variations in the output per unit of land, irrigation availability affords opportunity for crop diversification and for which on-farm water management becomes critical for improving the water use efficiency using new techniques available both for macro and micro irrigation. Conjunctive use of surface and groundwater could spread the irrigated command, besides increasing cropping intensity.

(c) Labour use

Farm labour is of three types: family labour provided by the participating members and its likely potential by the participating members and its likely potential by the dependents, hired labour on casual basis to carry the farm work, and contract labour hired on a permanent basis for a period of one crop season or more. Opportunity for off-farm and non-farm work,

relative wages and transaction cost of mobility, range of factor substitution through mechanisation - partial or total - are the major factors which determine the pattern and level of labour use, the former being the mix of different types of labour.[21]

3. Consumption

Consumption explains the ends and means of utilising incomes and it supports levels of living based on the mix in consumption bundle whose determinants are prices, tastes and preferences, and expectations as to life and living, the components of which behave on the Engels' fashion. The other matter of current relevance is concerned with the family size and consumption units, dependency ratio and gender mix, the population growth being endogenous. Besides, there are certain items of consumption, known as social expenses, covering incidence and calls which are often mandatory by customs and rituals perhaps.

Investment on growth related activities are meant to enhance the capacity of the FHH to expand income and employment generating activities which include investment in wealth and resource improvement and/or augmentation. Besides, the wealth seeking and assets building activities do improve not only social status and economic ability but more significantly the power that matters or leverage in markets and against risks likely to be encountered or simply the power of survival against great odds.

4. Growth

Growth is predominantly a long run concern of the FHH. Investment and technology are the twin requirements which could be efficiently integrated for higher productivity and growth. Land is the major factor of production whose use efficiency determines its productivity, but land is a heterogeneous resource subject to weather and mindless exploitation over the years and over many cultivating generations. Land is used or unused, the former is manifest under the most favourable conditions, which status is being lost to the latter due to non-optimal methods of production leading to resource depletion, decay and environmental damages. Conservation methods need investment in land development and corrections.

Stability in output of agriculture is a pre-condition for sustained economic growth and irrigation is a major instrument that reduces variations in output, besides improving productivity. Most of the development in agriculture starts from the area with good irrigation status and much of the success of the green revolution in India is drawn from irrigated agriculture. Canals are mostly owned and managed by public institutions as a production infrastructure, while others can be predominantly private, and occasionally public. In developing economies, canals form a part of production infrastructure.

The non-farm assets include consumer durables, business stocks and chits, business lending and real estate trade and so on. The consumer durables include vehicles and transport machinery related to part time farming and communication which are not strictly consumer durables as they can be producer means.

There are two other groups of factors related to human resource development and utilisation of public infrastructure created to support private decisions. Investment in education and training equips with skill and that in health plans support physical efforts.[22] The lament

of project men that farmers misdirect and misuse the credit secured for investment on other items would seem misconstrued, requiring a change in perception. This perhaps is the thrust of the FHH paradigm where an integrated action set would be relevant and efficient.

The other aspect is about the utilisation of infrastructure or, functionally, the access to infrastructure. The difference in approach between technologists and economists lies in the identification of the problem of accessibility and organisational solutions for them. Particularly, it is stressed that the case of small, resource poor farmers lies in the extent of their accessibility to technology and related services provided by infrastructure institutions.

IV

THE TARGET GROUP

The macro picture of agricultural change and development over the four decades, as argued earlier, shows very satisfactory results in output growth, income generation and employment in agriculture as a whole and it should be realised that these impressive achievements have been contributed mostly and significantly by farmers in the regions with more favourable conditions of production as to resource availability, particularly of irrigation, and access to management skills and opportunities. Consequently, regional imbalances and class differences in sharing benefit streams have come up for serious appraisal and review.[23]

1. Distribution of Operational Holdings

At micro level one could note in villages clear stratification and rigid barriers - physical and economic - to improve productivity. Basic to this differentiation is varying capability to acquire and use modern inputs and exploit the potential of available technology. It is argued that inequity in land distribution and its consequent impact on output could explain the widening gap between resource rich and poor farmers and at the same time reveal the limitations of different classes to achieve productivity improvement and employment generation. Further, this economic stratification of farmers could explain the difference in productivity, income and consumption levels. Therefore, our earlier specification of the FHH seems to warrant finer grouping over the range of divergence and one should look for a usable and operationally meaningful definition of these functional groups.

Our experience with the planned and state sponsored welfare programmes shows that there had been a very poor reach down to people for whom the programmes were conceived, designed and launched.[24] The task of identifying the target group seems daunting. There can be many criteria for stratifying farmers into groups such as rich and poor, progressive and laggards, large and small subsistence farmers and one could adopt any one of them depending upon the purpose of the study for which stratification is considered. One can observe three distinct groups/classes of farmers across the country, regional variations nevertheless. Their proportions and ranks may vary but they are broad indicators sufficient enough to classify them into these categories.

The Agricultural Census uses the classification of marginal, small, semi-medium, medium and large farmers based on the size of operational holdings; and for the present analysis the classes of operational holdings could be regrouped as Small Subsistence Farmers (less than 2 ha), Medium Achieving Farmers (2-10 ha), and Large Rich Farmers (more than

10 ha). They can be characterised, apart from farm size, on the basis of certain observable behaviour in decision-making on production, consumption and investment in the FHH. Certain stylised facts could be hypothesised on these groups.

Small Subsistence Farmer (SSF) is primarily conditioned by his survival perception, neither risk prone nor risk averse but risk neutral or indifferent, because nothing he could hedge against effectively as he is constrained by meagre assets and weak leverage. Physical assets of land and water can be improved if investments could be mobilised.[25] However, differing perceptions and ambitions of the FHH members and their interaction among themselves could keep farming as on-going entity instead of abandoning. They are still caught in a vicious circle of low investment, low productivity and low income with little chance to get out.

Medium Achieving Farmer (MAF) belongs to an upcoming force in the rural sector and in agriculture. He has escaped the vicious circle of poverty and stretching to reach the virtuous circle of prosperity.[26] This group of farmers is found highly motivated, articulate and aggressive to secure whatever the farm and family needs are. He is responsive and quick to effect technical change and put better management culture. He lacks adequate investible funds, which could not be generated internally. His motivation for achieving prosperity by productivity gains is extremely important and tends to be a major source of growth.

The Large Rich Farmer (LRF) depends on hired labour, machine power for factor substitution, has larger output securing market advantage and power, prefers food crops for wage payment in kind, and enjoys economies of scale in production, factor and product markets; and with large investible funds, he extracts power and patronage in social and political status. There are and there can be variations in characterisation such as large farmers in Bihar as compared to large farmers in Punjab, Kerala and Gujarat. Nevertheless, the stylised facts of characterisation are assumed to hold good for major segments of these groups in terms of proportionality. It would be interesting if some empirical base could be established for such groupings. Using the Agricultural Census data, the structural changes in size and distribution of these three groups are examined and certain broad patterns are discerned and discussed.

For the present analysis, the data on operational holdings for the years 1954-55 and 1960-61 are taken from the National Sample Survey (NSS) estimates while those for the years 1970-71, 1976-77, 1980-81 and 1985-86 are based on the Agricultural Census reports. The real magnitudes of these two are not strictly comparable but the percentage shares, as reflected in the relative positions, are indicative of the trends and, subject to this source bias, the data are analysed and the results are presented in Table VIII.

It might be seen that the average size of operational holding had been declining from 2.69 ha (1960-61) to 1.68 ha (1985-86) during the reference period which could explain the process of subdivision of holdings due to sale and partition as the number of operational holdings increased. The annual growth in the number of operational holdings had been varying during the period from 1.7 per cent at the beginning (1954-60) reaching 3.7 per cent midway (1960-70) and decreasing thereafter, touching a low of 1.9 per cent in 1980-85 whereas the corresponding figures for the total operated area were (-)0.5, 2.1 and 0.01 per cent only. Furthermore, the inter-group variation and distribution of operational holdings between SSF, MAF and LRF seem quite revealing. In 1954-55, SSF accounting for 60 per cent of the number of holdings, cultivated 15.4 per cent of the operated area, which increased

to 69.7 and 20.9 per cent in 1970-71, and 76.4 and 28.8 per cent in 1985-86 respectively, the average holding size decreasing from 0.79 ha to 0.69 ha and 0.63 ha respectively for the corresponding years.

TABLE VIII. DISTRIBUTION OF NUMBER AND AREA OF OPERATIONAL HOLDINGS IN INDIA (1954-55 TO 1985-86)

Size-group	1954-55		1960-61		1970-71		1976-77		1980-81		1985-86	
	A	B	A	B	A	B	A	B	A	B	A	B
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Small subsistence farmer (SSF)												
(a)	60.0	15.4	63.0	18.9	69.7	20.9	72.6	23.5	74.5	26.2	76.4	28.8
(b)	26.6	20.9	30.8	24.8	49.1	33.8	59.3	38.4	66.2	42.9	74.6	47.1
(c)	-	-	2.5	2.9	4.8	3.1	3.2	2.1	2.8	2.8	2.4	1.9
Medium achieving farmer (MAF)												
(a)	34.1	47.9	32.3	50.4	26.4	48.2	24.4	50.3	23.1	50.8	21.6	51.0
(b)	15.1	64.8	15.8	66.3	18.6	78.2	19.9	82.1	20.5	83.2	21.2	83.6
(c)	-	-	0.6	0.4	1.6	1.7	1.1	0.8	0.7	0.3	-1.3	0.1
Large rich farmer (LRF)												
(a)	5.9	36.6	4.7	30.7	3.9	30.9	3.0	26.2	2.4	23.0	2.0	20.2
(b)	2.6	49.5	2.3	40.4	2.8	50.1	2.4	42.9	2.2	37.7	1.9	33.2
(c)	-	-	-2.1	-3.3	2.0	2.5	-2.5	-2.6	-2.2	-3.2	-2.9	-2.5
Total												
(b)	44.3	135.2	48.9	131.5	70.5	162.1	81.6	163.4	88.9	163.8	97.7	163.9
(c)	-	-	1.7	-0.5	3.7	2.1	2.5	0.1	2.2	0.1	1.9	0.01
Per capita land operated (ha)												
SSF	0.79	-	0.81	-	0.69	-	0.65	-	0.65	-	0.63	-
MAF	4.29	-	4.20	-	4.20	-	4.13	-	4.06	-	3.94	-
LRF	19.04	-	17.07	-	17.89	-	17.88	-	17.14	-	17.20	-
Total	3.05	-	2.69	-	2.30	-	2.00	-	1.84	-	1.68	-

Source: Government of India (1960, 1967, 1975, 1983, 1987 a, 1989 a); NIRD (1991).
Note: (a) Percentage to total number/area of operational holdings.
(b) Absolute number/area under operational holdings.
(c) Annual growth rates.
A = Number of operational holdings.
B = Area of operational holdings.

The MAF had lost 12.5 percentage points during 1954-55 and 1985-86 in the share of the number and gained 3.1 percentage points in area indicating a marginal decline in the average size from 4.29 ha to 3.94 ha. Correspondingly, the number of LRF decreased by 3.9 percentage points during 1985-86 compared to 1954-55 whereas they lost 16.3 percentage points in area which stood at 33.2 per cent during 1985-86, the average size of farms falling from 19.04 ha to 17.20 ha over the period. This category had lost 16.3 mha, at 2.5 per cent per year, of which there was a decline of 4.5 mha during 1980-85.

There are many factors for this redistribution of different categories of farmers. Land reforms had direct impact of collecting surplus lands and distributing the surplus to the landless labourers and tenants.[27] More significant were the changes in perception and expectation leading to optimal adjustments. There were also changes in land tenure arrangements in response to the state interventions, and also inducement to maximise the benefits of upcoming technical change.[28] One should also look into the complementary process related to growth in income, employment, consumption, and investment propensities

and their changing patterns over time. Off-farm migration, part time farming and commuting for work, income and employment linkages could have changed the fortunes but the interactive process of land reform intervention strategies and the rapid turn over in landless labour had altered the marginal farmers' status.

Some of the most important characteristics which could describe different categories/class of farmers, viz., SSF, MAF and LRF, are about physical resources of farms. Among the physical resource parameters are: (i) net sown area (NSA), an embodiment of past investment and technical change, which can be a combination of owned and leased-in and leased-out lands; (ii) net irrigated area (NIA) which in a sense is an indirect index of output stability or minimised risk and uncertainty; (iii) gross irrigated area (GIA) reflects the efficiency in water resource use and intensity of land and water management; (iv) gross cropped area (GCA) again indicates the intensity of land and water use both under irrigated and rainfed conditions, incorporating a lot of native wisdom, robust commonsense and ingenuity in evolving crop and ancillary systems to manage the resource constraints and stochastic rains. The share of NSA-irrigated is contributed by various sources such as government canals, public tanks, private wells and tubewells. These discriminants are presented for each of the groups over the period from 1970-71 to 1980-81 in Table IX.

TABLE IX. DISTRIBUTION OF PERFORMANCE INDICATORS

(million hectares)

Size-group (1)	NSA (2)	NIA (3)	GIA (4)	GCA (5)	Irrigation as per cent of NSA (6)	Total area operated (7)
1970-71						
SSF	30.01	9.13	11.22	37.74	30.4	33.841
	(22.09)	(31.36)	(31.41)	(23.88)		(20.9)
MAF	67.18	14.94	18.38	78.05	22.2	78.233
	(49.46)	(51.32)	(51.46)	(49.38)		(48.2)
LRF	38.64	5.04	6.12	42.26	13.0	50.064
	(28.45)	(17.31)	(17.13)	(28.74)		(30.9)
All	135.83	29.11	35.72	158.05	21.4	162.138
	(100.0)	(100.0)	(100.0)	(100.0)		(100.0)
1976-77						
SSF	32.67	11.0	13.11	41.0	33.8	38.4
	(25.4)	(36.9)	(37.0)	(27.4)		(23.5)
MAF	66.11	15.1	18.07	76.9	22.8	82.0
	(51.5)	(50.7)	(51.0)	(51.3)		(50.2)
LRF	29.68	3.7	4.27	32.0	12.5	42.9
	(23.1)	(12.4)	(12.0)	(21.0)		(26.3)
All	128.54	29.8	35.45	149.9	23.5	163.3
	(100.0)	(100.0)	(100.0)	(100.0)		(100.0)
1980-81						
SSF	37.3	13.5	16.7	48.1	36.2	42.9
	(27.3)	(36.7)	(35.3)	(28.8)		(26.2)
MAF	70.4	18.6	24.4	86.5	26.4	83.2
	(51.5)	(50.5)	(51.6)	(51.8)		(50.8)
LRF	28.9	4.7	6.3	32.5	16.3	37.7
	(21.2)	(12.8)	(13.3)	(19.5)		(23.0)
All	136.6	36.8	41.3	167.1	26.9	163.8
	(100.0)	(100.0)	(100.0)	(100.0)		(100.0)
1986-87						
SSF	(30.8)	(38.2)	-	(32.7)	(38.2)	(30.0)
MAF	(52.7)	(49.9)	-	(51.8)	(49.9)	(52.7)
LRF	(16.4)	(11.9)	-	(15.5)	(11.9)	(17.3)

Source: Government of India (1975, 1983, 1987 a, 1993 d).
Note: Figures in parentheses are percentage shares of the classes to the total.

We may note that SSF cultivated 30 mha in 1970-71, accounting for 22 per cent of total NSA, and it increased by 7.3 mha over a decade, the change in percentage share being five points; and 30.4 per cent of the area was irrigated which again rose by another 5.8 percentage points in a decade. On the other hand, MAF had 49 per cent of NSA with an area of 67 mha which increased by 3.2 mha and its irrigated share had risen by 4 percentage points. Nearly 28 per cent of NSA was operated by LRF in 1970-71 which decreased to 21 per cent in 1980-81 and the irrigated NSA had, however, increased to 16 per cent.

In terms of annual rate of growth, SSF had registered growth rates of 2.2, 4.0, 4.1, 2.5 and 4.0 per cent in NSA, NIA, GIA, GCA and irrigated share in that order; MFA had marginal growth in NSA and GCA and between 2 and 3 per cent for the other magnitudes. LRF had larger negative growth rate in NSA (-) 2.9 per cent and GCA (-) 2.6 per cent and very small growth in NIA, GIA and irrigation share. In general, in relative terms, SSF had high growth rates, a process of atomisation; MAF with moderate growth in line with the overall situation and LRF had negative growth, suggesting some degree of substitution between SSF and LRF, significantly. It would be interesting to note that in most cases low productive marginal lands are transferred. MAF had recorded significant growth rate over 2 per cent in irrigation parameters and to a lesser extent in some areas indicating intensive mode of production.

Land use pattern reveals that during the reference period, around 94 per cent of farms were wholly owned and self-operated, cultivating equal share of land for all the classes. Operational holding includes ownership and leased lands; net cropped area (NCA) was more than 90 per cent of operated area with the exception of LRF which had around 84 per cent. Fallows varied between 2.9 and 4.0 per cent in SSF, between 3.8 and 5.5 per cent in MAF; and around 12 per cent in LRF.

Among the sources of irrigation, MAF depends on canals (50 per cent), the rest being provided by tanks and wells, whereas LRF had around 10 per cent under irrigation drawn from canals, tanks and wells almost equally. Nearly 86 per cent of SSF had, on the average, half of the area irrigated by canals and the rest by tanks and wells. Among the major crops, rice, wheat, millets, pulses and oilseeds are important. Nearly two-fifth of rice area is irrigated in SSF, half in MAF and one-tenth in LRF. Similar trends on the whole are evident for wheat crop, with deviation of 14 per cent for LRF. Irrigated pulses are around 50 per cent in MAF, 28 per cent in SSF and 20 per cent in LRF. The cropping pattern reveals that in general when irrigation is available, SSF prefers superior grains and cash crops such as sugarcane, groundnut and cotton; MAF grows cash crops to gain larger marketable surplus, and LRF raises cash crops in the limited irrigated lands and large areas of pulses, fibre and millets.

One should be extremely cautious in interpreting the percentage shares. There are issues of dimensionality and direction: high percentage share in small area still suffers diseconomies; and similarly, growth in number diminishes the size of operational holdings leading to continuous diminution, that is in the reverse direction. Certain auxiliary indicators are necessary to study the quantitative and qualitative aspects of development parameters. Productivity is one of them but not used here as the data are not readily available; the others are quality of land, location of land in irrigation system and transaction costs. The information gap exists and is worth noting for future studies.

The growing numerical strength of SSF and declining average size of operational holdings indicate the weakness in their access to critical resources of production to escape low productivity trap, nor could they be activated with a burning sense of motivation for

participation in the development process, in the absence of widespread awareness of the potential for change. Poor quality of land and low crop yields drive to subsistence level and if one could include high dependency ratio the condition becomes worse.[29]

At the same time MAF tends to be an active entrepreneurial group and reaching for higher levels of productivity and prosperity, they become very active in stretching themselves to the realm of realism under the aegis of bureaucratic formalism and management to secure the much needed productive assets, and/or their services, subsidies and information. Much of this group seems to represent the fall out of structural changes and land reform interventions. This midddle group seems to benefit from the development and welfare programmes designed for SSF, and also the assets and market advantages of LRF.

V

POLICY DETERMINATION

We propose for the scheme of development of rural sector in general and agricultural development in particular during the next two decades that the target group will be the SSF while the other groups MAF and LRF constitute what can be known as creamy layer of the rural society as far as development interventions and initiatives are concerned. Our focus will exclusively be on SSF, the target group which suffers from lack of access to information, infrastructure, technology and inputs and our concern will therefore be how to motivate them to participate in the development process and what policy instruments are necessary to empower this group to have command over resources and institutions.[30]

In the absence of countervailing power, they need to be actively supported to transact in the links of globalised markets. Imperfections in domestic markets for processing and exports and in contrived factor markets, particularly for finance and information, warrant for a support system to SSF which may be specific, time-bound and target oriented. The concept of safety net for the SSF in the periphery seems very relevant and policy intervention becomes inevitable.[31] The case for a safety net is a bit complicated, albeit agreeable to many, as the goal is set to secure sustainable real income for SSF such that at the end of the period they move into the core for gainful participation in the 'level playing field'.

Simply described, SSF have small, owner operated, family labour using farms with inward looking and risk indifferent. They are producing small marketable surplus that too is not even disposed of with advantage. Crop system is generally foodgrains oriented, along with fodder for livestock with low productivity. Little wealth, scarce savings, low investment, high dependency ratio in family member composition drive them down to the line of subsistence.

The positive factors are, however, the dependent family labour and expectation for better days. Some members of the FHH have skills, ambitions and drive to secure employment in off-farm and non-farm avocations elsewhere and they may live in the FHH or keep strong contact with the FHH, even if they live outside. They serve as catalyst and spark interest for change and for efficiency. This intra-FHH interactions help the FHH to survive as an on-going entity. More important, with their skills, the size could be used with advantage for intensive farming to produce exportable products which are labour intensive.

In a broader framework, development issues of SFF are examined at two levels. First, at the macro level the supportive elements of policies are related to prices, tariff, taxes and income transfer and it turns out to be exogenous to SSF system. Second, at the micro level,

resources, technology, skills and attitudes, access to the use of critical inputs, and labour are the elements of decision domain. An integration of macro and micro decision parameters in an optimal way is necessary to solve the problems of poverty, employment and growth.

The problems, feasible solutions and policy options for the development of SSF are presented in Table X. They are examined and specified in the context of resources, cropping systems, inputs and inputs delivery systems, relevance of and programmes for research, transfer of technology and feedback. Incentives to motivate for assuming greater risks and entrepreneurial efforts for sustainable growth of farm income and family labour employment are indicated. It may be noted that the subsidy-incentive system is concerned with the state's role in providing a safety net to the target group. This would imply greater emphasis on protective care against possible aberrations of free market functions. Subsidising infrastructure building is a supportive element which could be functionally a common property.

TABLE X. DECISION FRAMEWORK FOR SUBSISTENCE FARMERS

Problems (1)	Solutions (2)	Policy option (3)
1. Resources Saline/alkaline Cultivable waste Floods and drainage Irrigation distribution	Soil reclamation and quality improvement. Land management system improvement and management. Groundwater management.	Private investment supported by bank finance and state subsidies. Group action with bank finance and small structures to regulate supply irrigators society to manage water use. Subsidies as efficiency incentives for group action. Training in management skills. Initial subsidy for water energy saving structure and equipment; regulation of density of wells.
2. Cropping systems Efficient cropping in respect of higher income and employment	Crop substitution: raise high value crops, increase crop intensity. Design system mode with integrated farming systems. Rainfed crops improvement and drought proofing technology.	Regulation of density of wells. Regional research for location-specific crop problems: resistant breeding, biotechnology and packages of practices for systems optimisation. Strengthen mission oriented problem solving research for livestock, forestry and horticulture issues along with watershed operational research.
3. Inputs Inefficient system of seeds, fertilisers and chemicals	Privatisation of trade, bulk purchase, storage by group	Subsidisation of infrastructure for distribution of fertiliser, seed and chemicals. Market intervention for timely supply through inventory management. Regulate market transaction.
4. Technology appropriate to resource poor farmers ultimately growth oriented. Efficient transfer of technology	Regionalisation of research: location-specific and problem solving lab to land and land to lab linkages. Strengthening of extension system for target groups.	Reorientation of research by SAUs and ICAR institutions towards problem solving in respect of target group of farmers. Processing and packaging. Extension by Department of Agriculture and SAUs must have a mission mode of target groups well-being.

(Contd.)

TABLE X *(Concld.)*

Problems (1)	Solutions (2)	Policy option (3)
5. Incentives for high productivity through technical change	Remunerative prices with provision for market intervention and supply management. Subsidies on fertilisers, power.	Price policy on support prices and open market operation, warehousing and transport, provision of safety net.
6. Manpower utilisation	Training in production and management skills at KVKs, management institutions, extension training institutions.	Target-specific and time-bound subsidies. Farmers training for the target groups at multiple points and entries. Supporting NGOs. Training cost be shared by the state.
7. Infrastructure, administration and management	Farmer responsive and farmer-friendly administration for cost-effective implementation of mission oriented programmes with continuous monitoring and evaluation of land reforms. Developing roads and communication, education, drinking water, health and sanitation.	There should be national policy for the uplift of the target group. Alternative management for efficient production, processing and marketing. An institution to organise and manage the programmes which is target-specific and time-bound participatory programmes

Investment in human resource development is the other parameter of SSF development. The characterisation is not complete as finer refinement of issues and specification of options are possible and could be more efficient. These should be evaluated in detail at the level of decision-making unit at the level of village or a group of villages or watershed, as the case may be. One might recall that programmes designed to be uniform for all the regions had failed in the past. They were mainly due to inflexibility and lack of sensitisation with local decision milieu.

Within the overall objective of providing information, infrastructure and safety net for SSF, the action programme should be appropriate down to the grassroot level. It would be the product of an interactive process in which SSF are involved right from day one. As a necessary condition, this participatory development model would require sensible debureaucratisation and workable decentralisation while the sufficient condition would be the involvement of grassroot institutions and non-government organisations.

Advisably, no efforts are made to identify and specify strategies for policy options as they are region-specific and they depend on the characteristics of SSF and peripheral opportunities and limitations. However, one might note that policy options are multidimensional involving SSF in government supported programmes and in combination with financial intermediation and action of parastatals.[32] Further, it may be argued, that the present administrative concern, organisational modes and institutional approach should be reoriented towards the target group such that not less than two-thirds of time, budget and investment are devoted for the mission mode for the development of SSF.[33] The other one-third could be in common streams, as information and infrastructure through mass media, available for all groups of farmers including the target group. This would supplement private efforts and corporate strategies for agricultural development.

The mission mode suggested includes a separate organisation to design, fund, monitor and evaluate programmes for the target group. Funding is not hard to find. There are wasteful expenditures due to duplication of efforts by a multitude of agencies seeking partial solutions, slippage and rent seeking because of institutional laxity, political interventions and bureaucratic lapses. With political will mobilised and brought to bear upon, it is feasible to subject the existing programmes such as IRDP, TRYSEM, DWCRA, NREP, RLEGP, JRY, DPAP, land reform, and a host of subsidies, to a comprehensive and critical review with reference to (a) congruence of goals and objectives vis-a-vis SSF development mission, (b) complementarities between programmes, and (c) design alternatives for integration of the projects to realise, over a time horizon, optimum results on investment and efforts.

Following a decision on national objective and approach mechanism, it would be necessary to examine appropriate institutional framework to organise the mission mode for SSF development. In this process, we would emphasise both decentralisation and debu-reaucratisation in development organisation. The base for SSF development will be village or a group of villages which is broad enough in structure to encourage participation. In the new context of changing phase of indicative planning and the expected progressive privatisation of distribution of inputs such as seed, chemicals, services in processing and packaging, financing and marketing, it would be possible to concentrate exclusively on SSF development by state and parastatals with complementary roles by the corporate sector.

Given this premise, the major burden of co-ordination and management of SSF development programmes can be assigned to district planning units which have to broadbase its membership. Possibly there can be alternate modes of organisation relevant to the situation.

The cardinal points are: (a) a policy decision on mission mode for SSF development as the instrument of agricultural development over the next two decades, (b) the organisation is completely decentralised and debureaucratised, and (c) management rests with the new panchayats and district planning committees. With this orientation it would be possible to secure meaningful and interactive participation by the target group and involvement of non-government organisations. The mission mode empowers the SSF to make their decision individually or in group to loft themselves on to the growth path and prosperity.

NOTES

1. I have benefited from the critical review, comments and enlightened discussion with my colleagues in the Centre for Agricultural and Rural Development Studies, Tamil Nadu Agricultural University, on various issues, concepts and approaches elaborated in this paper. I acknowledge their assistance with usual caveat on responsibility for the errors and bias. Rural bias is basic to my orientation and approach due to my lifelong association with rural people whose life, dreams and aspirations I am committed for; against bureaucratic rationality with its normative instrumental stance and limited relevance to the aspiration of rural people; non-government organisations and rural institutions work at the grassroot levels and to which we may add, albeit reluctantly, competitive, friendly market, as an instrument of innovative process currently under trial, perhaps.

2. For excellent review of and comments on growth theories, models and empirical evidence, refer Chakravarty (1987), Mundlak (1993), Krugman (1992), Reynolds (1975 a, b), Sen (1992), Hayami and Ruttan (1985), Drucker (1981), Bardhan (1993) and Romer (1993). Issues related to agricultural/rural development models, paradigms and evidence in developing countries are ably discussed by Balassa (1990), Binswanger and von Braun (1991), Ishikawa (1975), Johnston and Clark (1985), Ranis (1983), de Janvry (1979), Dantwala (1993), Shah (1993), Rajagopalan (1967 and 1983), Yamauchi (1987) and Kuttner (1985).

3. It is observed that there has been more than three-fold increase in foodgrains output over the past thirty years, and one-half to two-thirds of such increases could be, attributed to irrigation while seeds and fertilisers had complemented its use. See Seckler and Sampath (1985), Paroda (1992) and Rajagopalan (1970 b).

4. Capital formation in agriculture is one of the issues seriously debated by farmer groups. Pricing and agricultural

terms of trade are the major issues discussed and debated in national forums and they form the major plank of discussions by the farmers' lobby. For a macro view, see Adiseshiah (1993) and Granovsky (1993). It is estimated that a sum of Rs. 307,930 million was transferred from the agricultural sector through discriminatory prices between 1975-76 and 1983-84. See Dandekar (1986 and 1993). For terms of trade, see Tyagi (1986) and Vittal (1986). For agricultural capital formation over the years, see Government of India (1993 b) and Rajagopalan and Krishnamoorthy (1969).

5. For structural changes and agricultural transformation, see Reynolds (1975 a, b), Johnston and Clark (1983), V.K.R.V. Rao (1989 b) and Hayami and Ruttan (1985).

6. For an interesting defence of market-friendly economy and economic reforms, see World Bank (1991), Binswanger and von Braun (1991), and for incisive comments, see Dantwala (1993), Shah (1993), Adiseshiah (1993) and Mundle (1993).

7. The overall agricultural productivity is around 1.5 tonne/ha. In a comparative picture, it could be seen that India's average rice productivity is just 40 per cent of Chinese rice yield, approximately one-third of Korean yields and around 55 per cent of Indonesian yields. For wheat yield, Indian average is about 50 per cent of Chinese and Japanese yields and less than 30 per cent of British yields. Given the investment, technology and productivity nexus in India, the existence of low productivity trap could be hypothesised. See Government of India (1989 a).

8. According to one estimate, the absolute number of rural poor had increased from 257.9 million in 1970-71 to 283.7 million in 1987-88 (EPW Research Foundation, 1993). There exists extensive literature on concepts and estimates of poverty and policy intervention. See Ahluwalia (1978), Sen (1981, 1992), Parthasarathy (1987), Fields (1992), EPW Research Foundation (1993), Dev (1988) and Booth (1993).

9. For a seminal work on agro-climatic planning, see Government of India (1989 b, c). Consistent with the approach for decentralised planning, the work has been taken down to state and sub-regional levels with people's participation.

10. The estimates are based on preliminary analysis and they, nevertheless, are indicative of emerging activity and resource scenarios in agriculture. See Kashyap (1989) and Government of India (1983).

11. The modes are indicative of relative emphasis over three periods of agricultural planning. One might note overlapping strategies but, however, the fact of the matter is some sort of classification would be necessary and useful. The welfare mode characterises the concern about equity in the access to productive resources and distribution of benefit stream as well, besides employment opportunities and incremental incomes. It does have relevance to land reforms which pass through all the three periods and its emphasis being on consolidation of gains of such reforms. See Eighth Plan document, Government of India (1992 a, b) and the earlier Sixth and Seventh Five Year Plan documents. For a related alternate classification, see Seckler and Sampath (1985).

12. See Government of India (1959).

13. For a critical review of functions and performance of these organisations, see Shah (1993). An account of their performance reveals the disaster consequence of combining monitoring and management functions and vagaries of bureaucratic rationality. Also refer to Sarma (1981).

14. The distributional implications of the green revolution have been extensively analysed, policy options are evaluated and corrective intervention strategies are suggested in Programme Evaluation Organisation of the Planning Commission and academic research, reported in an extensive literature: Government of India (1987 b), Kutaula (1993), Dantwala *et al.* (1986), Dasgupta (1990) and Vyas (1990).

15. There have been substantial investments recently in agricultural research and extension under the aegis of the World Bank. The National Agricultural Research Project (NARP) in three phases provided support for strengthening regional and location-specific research with participation of enlightened farmers in problem identification and research formulation. Investment for restructuring and strengthening extension organisation for effective and rapid transfer of technologies has been put under National Agricultural Extension Project (NAEP). Training and Visit (T & V) system of approach, continuous monitoring and evaluation, on-job training for updating skills and professional competency are some of the project components. See Government of India (1993 c).

16. The mission mode provides for an intensive, concerted and time-bound locations-specific and problem solving programme. The success of the Technology Mission on Oilseeds could be attributed to the synergistic role of NDDB and other organisations. For an excellent discussion on this mode of approach, see Shah (1993).

17. Studies on the performance of IRDP (DRDA) and employment oriented programmes have shown mixed results. The approach of providing for assets building (IRDP, RLEGP), skills formation (TRYSEM), and for productivity gains and poverty alleviation has been distorted from the very beginning and the reach down effects of the programmes have been poor and misdirected due to mistargeting and extraneous social and political factors which had been unduly domineering. See Dantwala (1986), Wood (1977), Menon (1987, especially Chapter 12), Mukherjee (1984), Parthasarathy (1987), Ensminger (1989), Government of India (1992 b), Rajagopalan (1978), Rajagopalan and Ramasamy (1986) and Chopra and Kadekodi (1993).

18. The modelling of the FHH involves a micro focus even though macro reference is unavoidable. Particularly of interest are micro level assets creation and capacity augmentation which are complemented by infrastructure development which is mostly through public decisions. The activity set of the FHH is to optimise the micro and macro links such that

income and consumption sub-systems are synergised. Emphasis here is on the interrelations between income, consumption and growth and the inducement by technical change. This synthesis of functions of the FHH and a comprehensive view of the components of decision domain seem lacking in the discussions about the FHH decisions since most of them perceive in part, missing the whole, the proverbial elephant. For technical discussions of the FHH decisions, see Hazell and Anderson (1984), and de Janvry *et al.* (1992), Shand and Kalirajan (1993), Hanumantha Rao (1989 a), Dillon (1979) and Sarma (1981).

19. The case of resource poor farmers has been vigorously argued by Chambers and others and the main concern being that this group of farmers should not be left out of the growth path and to ensure this, technology should be relevant and less demanding. There are also recommendations by agro-biologists for the use of non-cash inputs such as seeding with optimal population, substitution of organic manures such as green manures, bio-fertilisers and farmyard manures for fertilisers in order to reduce demand for cash flows. For details on several of these issues, see Chambers *et al.* (1989), Paroda (1992) and Government of India (1993 d).

20. On an average, less than half the irrigation potential has been utilised at present. This would seem misleading since this percentage share is likely to be far above the average in river valleys and very low in rainfed drylands. Then dependence factor is very important and highly relevant. Seasonal rains influence certainty of water availability and therefore to equate 40 per cent of irrigation in Tamil Nadu with 90 per cent in Punjab or Haryana or Uttar Pradesh would be misleading. For discussion on irrigation and development in India, see Dhawan (1989), Ruth and Svendsen (1991), Ascher and Healy (1990), and Seckler and Sampath (1985).

21. With the development of transport and communication, commutation for work, particularly for non-farm jobs, is developing fast and this tends to influence the ability and productivity of work on the farm, besides increases in wages. There would seem a fundamental divergence in the perception of employment between farmer and the state and perhaps this is one of the significant handicaps observed in the context of seasonality and employment project strategies. Partial mechanisation, labour displacement and part time farming are changing the employment scenarios in the rural areas and one has to think about the review and revision of the concepts and paradigms of employment both at the micro and macro levels. Employment intensity is determined by factor endowment and skills for jobs. On labour, see Parthasarathy (1987).

22. The arguments for developing appropriate technologies and the need for orientation in research and development, on the one hand, and the emphasis on institutions and changes related to them to render the maximising technologies adaptable by all, on the other hand, would seem to converge on one idea, that is, about institutional development. For a discussion, see Government of India (1992 a,b), Paroda (1992), Grabowski (1987), Rajagopalan (1970 a,b) Chambers *et al.* (1989) and Shand and Kalirajan (1993).

23. The regional differences in income, employment and levels of living, particularly after the green revolution, are discussed at length by many commentators and in the Plan documents since the Fourth Plan. The class differentiation in resource base and inequity in income distribution and in sharing of benefit stream among the classes of farmers, specially those at the bottom, were debated and it was also reported that such differences tend to reduce over a period, indicating that the initial divergences tend to be transitory. There seems to be a rider or caveat relating to intersectoral linkages and inter-class mobility, the existence of which has to be secured. On the related issues, see Hazell and Ramasamy (1991), Menon (1987), Shah (1993), Raj (1990), Sen (1975), Joshi (1987), Bhaduri (1983), Sharma (1992), Vyas (1990), Rajagopalan and Krishnamoorthy (1969), Mellor and Ahmed (1988), Nachane *et al.* (1989), V.K.R.V. Rao (1989 b), Hanumantha Rao (1989 a), Dev (1989) and Rangarajan (1982).

The rationale for stratifying farmers in different classes draws very much on class behaviour at different levels, class advantage to different classes and the need to protect the handicapped ones. It follows that beyond the structural changes lies the necessity for group/class identification in relation to specific programmes. For institutional aspects, see Joshi (1987). It is emphasised that "Economic development through increased agricultural production on the lands of small and marginal farmers is of cardinal importance for bringing prosperity to the farming community.... (they) represent about 73 per cent of the land holdings but are cultivating only 23 per cent of the cropped area. Their yields are low and land is of very poor quality." See Government of India (1985, p. 12).

24. The reach down controversies are varied and interesting. Themes of misdirection centre around the perceived information on leakages, fund diversion and misuse. It is argued that less than 10 per cent of the intended benefits could reach the targeted farmers, the rest being knocked away by a spoils system. The lesson we could learn seems that unless target group is identified as per specified parameters and organisational efforts are pinned down on it, the chances of repeat performance seem great. For discussion on various related issues, see Menon (1987), Five Year Plan documents (various issues) and Rajagopalan and Ramasamy (1986).

25. Problems and issues about identification of small farmers, their behavioural patterns have been discussed in the literature. In the Five Year Plan documents attempts have been made to define them for purposes of policy direction. Small farmers are characterised to build a bench-mark for developing relevant research and technology. We propose that small farmers will have to be identified not merely with size but also on the basis of other parameters such as NSA, NIA and other assets. Currently, this would seem formidable, but once it is decided to have strong orientation towards small farmer development, this information gap has to be bridged through a series of studies. For small farmer characterisation, see Menon (1987), Five Year Plan documents (various issues), Dillon (1979), de Janvry (1979) and Dantwala

(1986).

26. Modelling of vicious and virtuous cycles are relative to resource background, investment domain and their nexus with technology. Research parameters are income and assets in per capita terms, investment per unit of land and technology in package to a system design. For further discussion, see Ascher and Healy (1990), Krueger (1993) and Kutaula (1993).

27. It is estimated that, through land reforms, around 20 million tenants became ryotwari tenants, and 3 million tenants acquired ownership of 3 mha; see Dandekar (1986). By March 1990, out of 2.8 mha declared surplus under land ceiling laws, 2.5 mha were taken possession and 1.9 mha were distributed among 4.36 million beneficiaries. See NIRD (1991).

28. This issue was a major focus of controversies during the sixties and the seventies. The resumption of land by landowners was due to emerging tenancy laws and, more significantly, in irrigated area, to benefit themselves through owner cultivation with modern technology. For international comparison, particularly of South Asia, see IRRI (1970), Basu (1987), Place and Hazell (1993), Swamy (1988) and Bell (1977).

29. See Eighth Five Year Plan document, Government of India (1992 a,b).

30. We are not proposing anything unheard of and the whole approach for agricultural and rural development is to give better focus on small and marginal farmers. As Dandekar (1986) puts it: "....the Government of India, almost from its inception has had special programmes for the poor and weaker section of the society." To be sure, the society had considered this issue as one of the major economic planks of freedom struggle. Note the euphoria of agrarian reforms and commitment to the upliftment of poor and bonded peasants, and landless labourers in the planning era. Unfortunately, it had been like the proverbial sacred cow, only to be adored and pampered but, nevertheless, left in lurch to fend her way. It is not that no efforts are made. Plenty of them were planned and tried with not much of a gain. The reasons are not unknown. Committees, commentators, serious economists, retired bureaucrats and others have said why policy measures failed. It is a paradox. We know the reasons, we know too the policy options and interestingly political will is not lacking and yet the problem exists. It seems reasonabe to examine the behaviour of institution in the context of new priorities and look for warranted change in behaviour on the part of bureaucrats and technocrats. What is proposed therefore relates to institutional changes and complete transformation in administrative and organisation culture and behaviour modes. See Ensminger (1989) and V.K.R.V. Rao (1989 b).

31. In the Eighth Plan document, additional allocation under JRY is proposed for creation of employment opportunities for a period of 90-100 days which is considered as 'safety net' for the unemployed poor. In the context of globalisation, tariff removal and subsidy reduction in the developing countries, it is claimed, can take advantage but with one caveat, that is, provided the competitive edge of our farmers are strengthened and sharpened. In our scheme of classification, SSF stands much handicapped and any measure for the removal of handicaps would constitute a positive development of the target group safety net.

32. V.K.R.V. Rao argued for diversion of government attention to the productivity of small holdings rather than to that of the larger holdings: "Instead of taking small holdings as a category which requires to be helped specially, government policy of alleviating poverty did not take up the question of productivity of small holdings and their ability to share the benefits of agricultural growth." He recommends that for drawing the Eighth Plan strategies the regional deficiencies and existence of a large number of small holders have to be given adequate attention (Rao, 1989 b). There seems a consensus at Government level, as indicated in the Eighth Five Year Plan document, on two issues. First, employment and poverty programmes have to be integrated to achieve best results for the investment, and second, small and marginal farmers should be supported in the scheme of efforts for agricultural development and what is required is a policy decision and declaration to the effect. Both together support our basic premise which warrants for all inclusive efforts in support of growth of SSF.

33. Mission mode is an approach for achieving a change through a set of specified goals, policy instruments and action strategies. The key element is a concerted and systems oriented holistic approach. This would call for strict co-operation of and co-ordination between line departments, parastatals, non-government organisation and participating farmers. The present mindset of a department dominance or segmented efforts should be replaced completely. One is aware of incongruities and divergences of plans and actions defying tenets of inter-disciplinary, inter-department and inter-agency co-operation in programme such as watershed development, wastelands improvement and the like and it will be imperative that such pitfalls are scrupulously avoided. This is basic to mission mode. For details of field problems, see Chopra and Kadekodi (1993).

REFERENCES

Adiseshiah, Malcolm (1992), *The Gap in Indian Economic Reforms Policy To-day: Agriculture*, Endowment Lectures on Social Sciences-1991, Centre for Agricultural and Rural Development Studies, Tamil Nadu Agricultural University, Coimbatore.

Ahluwalia, Montek S.; John Wall; Shlomo Reutlinger; Robert Cassen and Martin Wolf (1978), *India: Occassional Papers*, World Bank Staff Working Paper No. 279, The World Bank, Washington, D.C., U.S.A.

Ascher, William and Robert Healy (1990), *Natural Resource Policy Making in Developing Countries*, Duke University Press, Durham, North Carolina, U.S.A.

Balassa, Bela (1990), *Indicative Planning in Developing Countries*, World Bank Working Papers WPS 439, The World Bank, Washington, D.C., U.S.A.

Bardhan, Pranab (1993), "Economic Development and the Development of Economics", *Journal of Economic Perspectives*, Vol. 7, No. 2, pp. 129-142.

Basu, Kaushik (1987), *Technological Stagnation, Tenurial Laws and Adverse Selection*, WIDER Working Papers, WP 14, World Institute of Development Economics Research, Helsinki.

Bell, Clive (1977), "Alternate Theories of Sharecropping: Some Tests Using Evidence from Northeast India", *Journal of Development Studies*, Vol. 13, No. 4, pp. 317-346.

Bellamy, Margot and Bruce Greenshields (Eds.) (1992), *Issues in Agricultural Development: Sustainability and Co-operation*, I.A.A.E. Occasional Paper No. 6, International Association of Agricultural Economists, Dartmouth Publishing Company Ltd., Aldershot, Hampshire, England.

Bhaduri, Amit (1983), *The Economic Structure of Backward Agriculture*, Academic Press, London.

Binswanger, Hans P. and Joachim von Braun, (1991), "Technical Change and Commercialization in Agriculture: The Effect on the Poor", *World Bank Research Observer*, Vol. 6, No. 1, pp. 57-80.

Booth, Anne (1993), "Counting the Poor in Indonesia", *Bulletin of Indonesian Economic Studies*, Vol. 29, No. 1, pp. 53-83.

Centre for Monitoring Indian Economy (CMIE) (1992), *Basic Statistics Relating to Indian Economy, Vol. I: All India*, CMIE Publications, Bombay.

Chakravarty, Sukhamoy (1987), Post-Keynesian Theories and the Theory of Economic Development, WIDER Working Papers, WP 23, World Institute of Development Economics Research, Helsinki.

Chambers, R.; N.C. Saxena and Tushaar Shah (1989), *To the Hands of the Poor: Water and Trees*, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

Chopra, Kanchan and Gopal K. Kadekodi (1993), "Watershed Development: A Contrast with NREP/JRY", *Economic and Political Weekly*, Vol. 28, No. 26, June 26, pp. A-63-A-67.

Dandekar, V.M. (1986), "Agriculture, Employment and Poverty", *Economic and Political Weekly*, Vol. 21, Nos. 38 and 39, September 20-27, pp. A-90-A-100.

Dandekar, V.M. (1993), "Limits of Credit, Not Credit Limits", *Economic and Political Weekly*, Vol. 28, No. 39, September 25, pp. 86-95.

Dantwala, M.L. (1986), "Rationale and Limitations of Decentralised Planning", in M.L. Dantwala *et al.* (1986), *op.cit.*

Dantwala, M.L. (1993), "Agricultural Policy: Prices and Public Distribution System: A Review", *Indian Journal of Agricultural Economics*, Vol. 48, No. 2, April-June, pp. 173-186.

Dantwala, M.L.; Ranjit Gupta and Keith C. D'Souza (Eds.) (1986), *Asian Seminar on Rural Development: The Indian Experience*, CMA Monograph 120, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

Dasgupta, Sirpa (1990), *Class Relations and Technical Change in Indian Agriculture*, Macmillan, London.

Dhawan, B.D. (1989), "Water Resource Management in India: Issues and Dimensions", *Indian Journal of Agricultural Economics*, Vol. 44, No. 3, July-September, pp. 233-242.

de Janvry, Alain (1979), "Nature of Rural Development Programmes: Implications for Technology Design", in Alberto Valdes *et al.* (1979), *op.cit.*

de Janvry, Alain; M. Fafchamps, M. Raki and E. Sadoulet (1992), "A Computable Household Model Approach to Policy Analysis: Structural Adjustment and the Peasantry in Morocco", in Margot Bellamy and Bruce Greenshields (Eds.) (1992), *op. cit.*

Dev, S. Mahendra (1988), "Poverty of Agricultural Labour Households in India: A State Level Analysis", *Indian Journal of Agricultural Economics*, Vol. 43, No. 1, January-March, pp. 14-25.

Dev, S. Mahendra (1989), "Towards an Explanation of Spatial and Temporal Variations in Cropping Intensity in India", *Indian Journal of Agricultural Economics*, Vol. 44, No. 1, January-March, pp. 27-44.

Dillon, John (1979), "Small Farmers - A Problem or Not", in Alberto Valdes *et al.* (Eds.) (1979), *op. cit.*

Drucker, Peter F. (1981), "Toward the Next Economics", *Economic Theory and Policy in Disarray*, Vol. 1, pp. 4-18.

Ensminger, Douglas (1989), "In Support of a Systems Approach to Small Farm Agriculture and Rural Development", *IASSI Quarterly*, Vol. 8, No. 1, pp. 21-36.

EPW Research Foundation (1993), "Poverty Levels in India: Norms, Estimates and Trends", *Economic and Political Weekly*, Vol. 28, No. 34, August 21, pp. 1748-1768.

Fields, Gary S (1989), "Changes in Poverty and Inequality in Developing Countries", *World Bank Observer*, Vol. 4, No. 2, pp. 176-185.

Government of India (1959), *Report on India's Food Crisis and Steps to Meet It*, Agricultural Production Team Sponsored by the Ford Foundation, Ministry of Food and Agriculture, New Delhi.

Government of India (1960), *The National Sample Survey: Eighth Round: July 1954 - April 1955, Number 30 - Report on Land Holdings (2) (Operational Holdings in Rural India)*, National Sample Survey Organisation, Department of Statistics, Ministry of Planning, New Delhi.

Government of India (1967), *The National Sample Survey: Sixteenth Round: July 1960 - June 1961, Number 113 - Tables with Notes on Agricultural Holdings in Rural India*, National Sample Survey Organisation, Department of Statistics, Ministry of Planning, New Delhi.

Government of India (1975), *All India Report on Agricultural Census, 1970-71*, Ministry of Agriculture and Irrigation, New Delhi.

Government of India (1983), *All India Report on Agricultural Census, 1976-77*, Ministry of Agriculture, New Delhi.

Government of India (1985), *Seventh Five Year Plan, 1985-90, Vol. II*, Planning Commission, New Delhi.

Government of India (1987 a), *All India Report on Agricultural Census, 1980-81*, Ministry of Agriculture, New Delhi.

Government of India (1987 b), *Report of Expert Group on Cropping Pattern*, Ministry of Agriculture and Co-operation, New Delhi.

Government of India (1988 a), "A Note on Some Aspects of Operational Holdings: NSS 37th Round (1982)", *Sarvekshana*, Vol. 12, No. 1, July, pp. 24-52.

Government of India (1988 b), *Agricultural Statistics at a Glance*, Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi.

Government of India (1989 a), *Indian Agriculture in Brief*, 22nd Edition, Directorate of Economics and Statistics, Department of Agriculture and Co-operation, Ministry of Agriculture, New Delhi.

Government of India (1989 b), *Zonal Profiles*, Agro-Climatic Regional Planning Unit, Planning Commission, Ahmedabad.

Government of India (1989 c), *Agro-Climatic Zones: Profiles and Issues*, Agro-Climatic Planning Unit, Planning Commission, Ahmedabad.

Government of India (1992 a), *Eighth Five Year Plan, 1992-97, Vol. 1*, Planning Commission, New Delhi.

Government of India (1992 b), *Eighth Five Year Plan, 1992-97, Vol. 2*, Planning Commission, New Delhi.

Government of India (1993 a), *Economic Survey 1992-93*, Economic Division, Ministry of Finance, New Delhi.

Government of India (1993 b), *National Accounts Statistics*, Department of Statistics, Ministry of Planning and Programme Implementation, Nzew Delhi.

Government of India (1993 c), *Annual Report 1992-93*, Department of Agriculture and Co-operation, Ministry of Agriculture and Co-operation, New Delhi.

Government of India (1993 d), *All India Bulletin on Input Survey (1986-87), Agricultural Census Division*, Ministry of Agriculture, New Delhi.

Grabowski, Richard (1987), "The New Technology and Reform: A Synthesis", *Indian Journal of Agricultural Economics*, Vol. 42, No. 1, January-March.

Granovsky, A.E. (1993), *Economic Development in South Asia*, Agricole Publishing Academy, New Delhi.

Hayami, Yujiro and V.W. Ruttan (1985), *Agricultural Development: An International Perspective*, The Johns Hopkins University Press, Baltimore.

Hazell, Peter B.R. and J.R. Anderson (1984), "Public Policy toward Technical Change in Agriculture", *Greek Economic Review*, Vol. 6, No. 3, pp. 453-482.

Hazell, Peter B.R. and C. Ramasamy (1991), *The Green Revolution Reconsidered*, The Johns Hopkins University Press, Baltimore.

International Rice Research Institute (IRRI) (1970), *Changes in Rice Farming in Selected Areas of Asia*, Los Banos, Manila, The Philippines.

Ishikawa, Shigeru (1975), "Peasant Families and the Agrarian Community in the Process of Economic Development", in Lloyd G. Reynolds (Ed.) (1975 a), *op. cit.*, Chapter 16, pp. 451-495.

Johnston, Bruce F. and William C. Clark (1983), "Rural Development Programmes: A Critical Review of Past Experience", in Allen Maunder and Kazushi Ohkawa (Eds.) (1983), *Growth and Equity in Agricultural Development*, Gower Publishing Company, Aldershot, Hampshire, England.

Joshi, P.C. (1987), *Institutional Aspects of Agricultural Development*, Allied Publishers Pvt. Ltd., Delhi.

Kashyap, S.P. (1989), "Resource Base, Crop Output and Employment Structure in 15 Agro-Climatic Zones - An Overview", in *Agro-Climatic Regional Planning Projects, Technical Papers (Processed)*, Agro-Climatic Regional Planning Unit, Ahmedabad.

Krueger, Anne O. (1993), "Virtuous and Vicious Circles in Economic Development", *American Economic Review*, Vol. 83, No. 2, pp. 351-355.

Krugman, Paul (1992), "Toward a Counter-Counterrevolution in Development Theory", *Proceedings of World Bank Annual Conference of Development Economics*, The World Bank, Washington, D.C., U.S.A.

Kutaula, S.S. (1993), "Technological Innovations in Agriculture: Policy Options for Social Welfare", *Economic and Political Weekly*, Vol. 28, Nos. 29 and 30, July 17-24, pp. 1533-1537.

Kuttner, Robert (1985), "The Poverty of Economics", *Atlantic Monthly*, February, pp. 74-84.

Mahajan, O.P. (1982), *Economic Planning and Regional Development in India*, ESS Publishers, New Delhi.

Mellor, John and Raisuddin Ahmed (Eds.) (1988), *Agricultural Price Policy for Developing Countries*, The Johns Hopkins University Press, Baltimore.

Menon, K.P.A. (1987), *Indian Agriculture: Administrative and Organizational Constraints,* Sree Deep Publications, New Delhi.

Mukherjee, Pranab (1984), *Beyond Survival: Emerging Dimensions of Indian Economy,* Vikas Publishing House Pvt. Ltd., New Delhi.

Mundlak, Yair (1993), "On the Empirical Aspects of Economic Growth Theory", *American Economic Review,* Vol. 83, No. 2, pp. 415-420.

Mundle, Sudipto (1993), "Policies, Paradigms and Development Debate at Close of Twentieth Century", *Economic and Political Weekly,* Vol. 28, No. 36, September 4, pp. 1879-1882.

Nachane, D.M.; S.D. Sawant and C.V. Achuthan (1989), "Agriculture and Industry: A Study of Selected Linkages", *Indian Journal of Agricultural Economics,* Vol. 44, No. 2, April-June, pp. 140-149.

National Institute of Rural Development (NIRD) (1991), *Rural Development Statistics, 1990,* Hyderabad (A.P.).

Parthasarathy, G. (1987), "Changes in the Incidence of Rural Poverty and Recent Trends in Some Aspects of Agrarian Economy", *Indian Journal of Agricultural Economics,* Vol. 42, No. 1, January-March, pp. 1-21.

Paroda, R.S. (1992), "Crops Science Research for Sustainable Agriculture in India", Dr. C.V. Chalam Memorial Lecture, Tamil Nadu Agricultural University, Coimbatore.

Place, Frank and Peter Hazell (1993), "Productivity Effects of Indigenous Land Tenure Systems in Sub-Saharan Africa", *American Journal of Agricultural Economics,* Vol. 75, No. 1, February, pp. 10-19.

Raj, K.N. (1990), "Ownership and Distribution of Land in India, 1954-55", *Organizational Issues in Indian Agriculture,* Oxford University Press, Delhi.

Rajagopalan, V. (1967), "Some Aspects of Growth in Over-Populated Countries", *Indian Journal of Agricultural Economics,* Vol. 22, No. 4, October-December, pp. 80-86.

Rajagopalan, V. (1970 a), *Changes in Rice Farming in Selected Areas of Asia: North Arcot District,* International Rice Research Institute, Los Banos, Manila, The Philippines.

Rajagopalan, V. (1970 b), "Impact of High Yielding Varieties Programme on Agricultural Production", *Silver Jubilee Commemoration Seminar Papers,* Government of Tamil Nadu, Madras.

Rajagopalan, V. (1978), *Rural Development, Dharmapuri District,* Co-operative Printing Press, Coimbatore.

Rajagopalan, V. (1983), "Deceleration of Rates of Agricultural Growth in Tamil Nadu: Trends and Explanatory Factors", *Indian Journal of Agricultural Economics,* Vol. 38, No. 4, October-December, pp. 568-584.

Rajagopalan, V. and S. Krishnamoorthy (1969), "Elasticities and Strategies for Capital Formation - A Micro Analysis", *Indian Journal of Agricultural Economics,* Vol. 24, No. 4, October-December, pp. 110-116.

Rajagopalan, V. and C. Ramasamy (1986), "The Impact of Technological Change in Agriculture on Rural Welfare, *Agricultural Situation in India,* Vol. 41, No. 8, November, 1986.

Rangarajan, C. (1982), *Agricultural Growth and Industrial Performance in India,* International Food Policy Research Institute, Washington, D.C., U.S.A.

Ranis, Gustav (1983), "Growth and Equity in Development: An Overview", in Allen Maunder and Kazushi Ohkawa (Eds.) (1983), *Growth and Equity in Agricultural Development,* Gower Publishing Company, Aldershot, U.K.

Rao, C.H. Hanumantha (1989 a), "Technological Changes in Indian Agriculture", *Indian Journal of Agricultural Economics,* Vol. 44, No. 4, October-December, pp. 385-398.

Rao, V.K.R.V. (1989 b) "Some Reflections on the Problems Facing Indian Agriculture", *Indian Journal of Agricultural Economics,* Vol. 44, No. 4, October-December, pp. 379-384.

Reynolds, Lloyd G. (Ed.) (1975 a), *Agriculture in Development Theory,* Yale University Press, New Haven.

Reynolds, Lloyd G. (Ed.) (1975 b), "Agriculture in Development Theory: An Overview", in L.G. Reynolds (Ed.) (1975 a), *op. cit.,* Chapter 1, pp. 1-24.

Romer, David (1993), "The New Keynesian Synthesis, *Journal of Economic Perspectives,* Vol. 2, No. 2, pp. 129-142.

Ruth, Meinzen-Dick and Mark Svendsen (Eds.) (1991), *Future Directions for Indian Irrigation: Research and Policy Issues,* International Food Policy Research Institute, Washington, D.C., U.S.A.

Sarma, J.S. (1981), *Growth and Equity: Policies and Implementation in Indian Agriculture,* International Food Policy Research Institute, Washington, D.C., U.S.A.

Seckler, David and R.K. Sampath (1985), *Production and Poverty in Indian Agriculture,* Working Paper 1, International School for Agricultural and Resource Development, Colarado State University, Fort Collins, Colarado, U.S.A.

Sen, Sudhir (1975), *Reaping the Green Revolution, Food and Jobs for All,* Tata McGraw Hill, Delhi.

Sen, Amartya (1981), *Poverty and Famines: An Essay on Entitlement and Deprivation,* Clarendon Press, Oxford.

Sen, Amartya (1992), *Inequality Reexamined,* Oxford University Press, Bombay.

Shah, Tushaar (1993), "Agriculture and Rural Development in 1990s and Beyond: Redesigning Relations between State and Institutions of Development", *Economic and Political Weekly,* Vol. 28, No. 39, September 25, pp. A-74-A-85.

Shand, R.T. and K. Kalirajan (1993), *Frontier Economics: Efficiency of Firm Performances with Technological Change,* Research School of Pacific Studies, Australian National University, Canberra, Australia.

Sharma, Pradeep K. (1992), "Producer Subsidies in Cereals Economy: Implications for Policy", *Indian Journal of Agricultural Economics,* Vol. 47. No. 3, July-September, pp. 343-348.

Swamy, Dalip S. (1988), "Agricultural Tenancy in the 1970s", *Indian Journal of Agricultural Economics*, Vol. 43, No. 4, October-December, pp. 555-565.

Tyagi, D.S. (1986), "Domestic Agricultural Terms of Trade in India and Its Effects on Supply and Demand of Agricultural Sector" (Processed), Paper presented to VIII World Economic Congress of International Economics Association held in New Delhi, pp. 111-148.

Valdes, Alberto; Grant M. Scobie and John Dillon (Eds.) (1979), *Economics and the Design of Small-Farmer Technology*, Iowa State University Press, Ames, Iowa.

Vittal, Nalini (1986), "Intersectoral Terms of Trade in India: A Study of Concept and Method", *Economic and Political Weekly*, Vol. 21, No. 52, December 27, pp. A-147-A-166.

Vyas, V.S. (1990), "Food Policies and Food Security in Asia with Particular Reference to South Asia", in D.S. Tyagi and V.S. Vyas (Eds.) (1990), *Increasing Access to Food - The Asian Experience*, Sage Publications, New Delhi.

Wood, Geof (1977), "Rural Development and the Post-Colonial State: Administration and Peasantry in the Kosi Region of North-East Bihar, India", *Development and Change*, Vol. 8, pp. 307-323.

World Bank (1991), *World Development Report 1991: The Challenge of Development*, Oxford University Press, Oxford.

World Bank (1992), *World Development Report 1992: Development and Environment*, Oxford University Press, New York.

Yamauchi, Hiroshi (1987), "Structural Variations of Agriculture in the Pacific", *Agricultural Economics*, Vol. 1, pp. 113-125.