

PART - II

A Review of Critical Policy Issues

2.1 Introduction

As we have explained in the preface and in Part I of this paper, the purpose of Part II is not to open up for review the entire policy agenda. If it is accepted that the government has to be less interventionist in future, it would follow that the government should choose to take up only the policies consistent with its new role towards agriculture. This raises the tricky question of disengagement from the present policy commitments and transition to the new role. The process of disengagement and transition is likely to be protracted with frequent interruptions occasioned by political wranglings. For the purpose of this paper, we have selected only a few policy areas in which, in our view, the government would have to play an active role for a long time to come.

It is useful while looking at these policy areas to keep in mind certain persistent features of policy regimes for agriculture as they have operated so far in India. First, there are abundant findings to show that India shares with many developing countries a strong preference for the development path seeking to promote modern industries at the cost of discriminating against agriculture. Researchers have argued that the policy regime in India from Independence right up to about the early nineties has had the effect of lowering the prices received by the farmers for their output while raising the prices paid by them for inputs purchased from industries [Gulati (1993), Singh (1995), Economic Survey (GOI), 1996-97, Parikh (1999)]. A world Bank study covering 18 developing countries over the period 1960- 85 found that there has been an enormous transfer of income out of agriculture estimated at 46 per cent of the gross domestic product originating from agriculture per year over the period of quarter of a century (Schiff and Valdes, 1995). It is easy to imagine the impact of such large income transfer from agriculture on farmer's incentives and capacity to invest and take risks. Second, between the better-off and the poor in agriculture, the policy regime has favoured the former neglecting the development potential waiting to be tapped in the poorer parts of agriculture. As a result, a dualistic structure has emerged in agriculture with a small but dynamic part aligned with the mainstream economy and polity and a large part languishing with inadequate access to the policymaker and to mainstream opportunities. Third, the policymaker remains far too preoccupied with the problems of the moment and the fire-fighting operations to deal with them; the long term issues like sustainable development and inter-regional and inter temporal equity get neglected. Underlying these features of the policy regime is the development perspective still lingering in Indian policymaking that agriculture is inherently traditional and that modernisation and development come from growth in other sectors. With this view of agriculture, the natural next step is to regard farmers-and rural society in general - as people unwilling to change from the attitudes, perceptions and lifestyle established over generations in the past. Hence, it is the position today that half-a-century after Independence few city dwellers -and the affluent in rural society-would want to live in villages.

Agricultural policies in India have to manoeuvre within the constraints imposed by the features of the policy regime described above. It is not unusual to come across corrective measures in policies recommended over and over again by succession of committees but remaining unimplemented. Unfulfilled targets cause little embarrassment as alibis would be

readily available in the past reports. The ingenious invention of measuring programme achievements by expenditures incurred helps progress reports to look impressive and provides basis for demanding increased funds for the next year. This is not to ridicule implementation of policies or the programme personnel. Our intention is only to point out that such weaknesses in implementation are inevitable given the prevailing policy regime. The policy regime affects policies at two levels. Policies formulated at the top without a sense of commitment to the goals which they are expected to achieve tend to be ritualistic. The parameters relating to time-frame, phasing, release of funds and monitoring and evaluation are disregarded with impunity. Delays, lack of coordination and indifference towards mounting costs become rampant. Corruption and leakages spread widely. At the ground level, the personnel finds that their conscientiousness, performance and rapport with the target groups bring neither any appreciation nor rewards. The target groups, in turn, remain cynical and passive. It is, thus, that the policy regime becomes ineffective from the top downwards. Trying to improve the system by looking at only the lower and junior levels may yield some marginal improvements but no major breakthroughs. It is the reforming of the regime described in Part I which would make it possible for more thoroughgoing changes to occur partly through planned improvements and partly as a consequence of pressures from outside. It would be legitimate to expect substantive improvements to occur in the coming years in the policies considered in the sections which follow. The priority tasks identified for these policies could be of help in guiding this process along the right direction.

2.2 Capital Formation

The pace and pattern of agricultural development are largely conditioned by the growth of infrastructural facilities of irrigation, road, market, power, cold storage, etc. Infrastructure plays a critical role on both input and output sides. While on the input front, it helps ensure timely and adequate delivery to farmers, on the output front, it helps integrate local markets with national and international markets. Therefore, an adequate and efficient infrastructure system is essential for realising the potential of the sector. In this context, the experience of China shows that high rate of investment in agriculture can ensure big spurt in agricultural output over a long period (Rao and Gulati, 1994).

However, one of the most disquieting developments in the agricultural sector during the last two decades has been the neglect of capital formation, particularly in the public sector. Gross Capital Formation (GCF) in agriculture as per cent of total gross capital formation in the economy, after rising during the 70's, declined during the eighties and nineties. In 1998-99 it was just 5.5 per cent as against 16.3 per cent in 1980-81. Further, GCF in agriculture as per cent of GDP in agriculture also declined during the last two decades from 10.9 per cent in 1980-81 to 6.2 per cent in 1998-99 (Table 2.2.1 and Chart 2.2.1).

Table 2.2.1: Gross Capital Formation in Agriculture

Year	GCF in Agriculture			(Rs.Crore)	
	Public	Private	Total	GCF as % of GDP in Agriculture	GCF as % of Total GCF in Economy

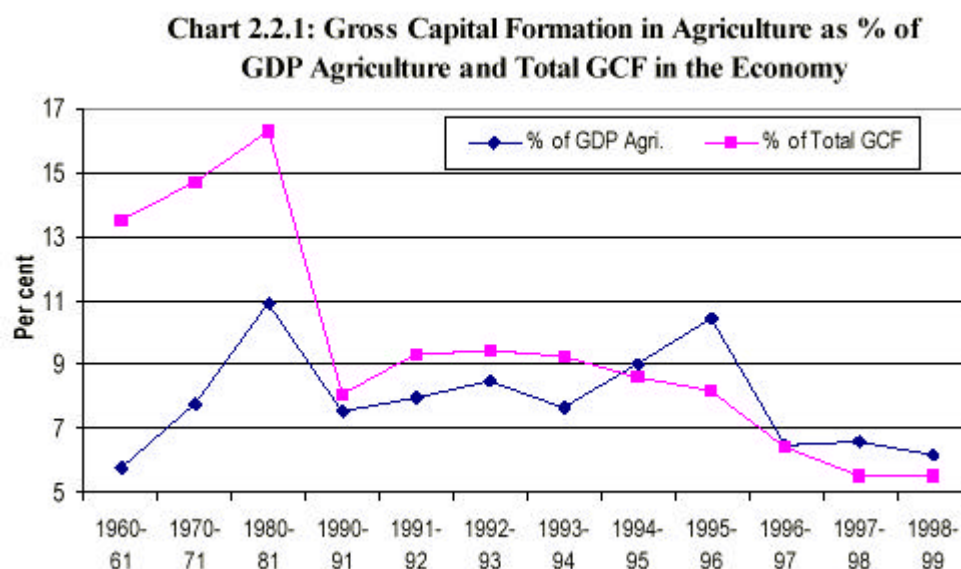
At 1980-81 Prices					
1960-61	589	1079	1668	5.8	13.5
1970-71	789	1996	2785	7.8	14.7
1980-81	1796	2840	4636	10.9	16.3
1990-91	1154	3440	4594	7.5	8.1
1991-92	1002	3727	4729	8.0	9.3
1992-93	1061	4311	5372	8.5	9.4
1993-94	1153	3878	5031	7.7	9.3
1994-95	1316	4940	6256	9.0	8.6
1995-96	1268	5693	6961	10.4	8.2
At 1993-94 Prices					
1996-97	4689	11921	16610	6.5	6.4
1997-98	4240	12140	16380	6.6	5.5
1998-99p	3876	12581	16457	6.2	5.5
Annual Average Growth (%)					
1971-79	10.0	7.2	7.9		
1980-89	-4.0	-0.1	-1.5		
1990-98	-1.9	8.1	5.6		

Note: P : Provisional. @ : Gross Capital Formation adjusted for errors and omissions

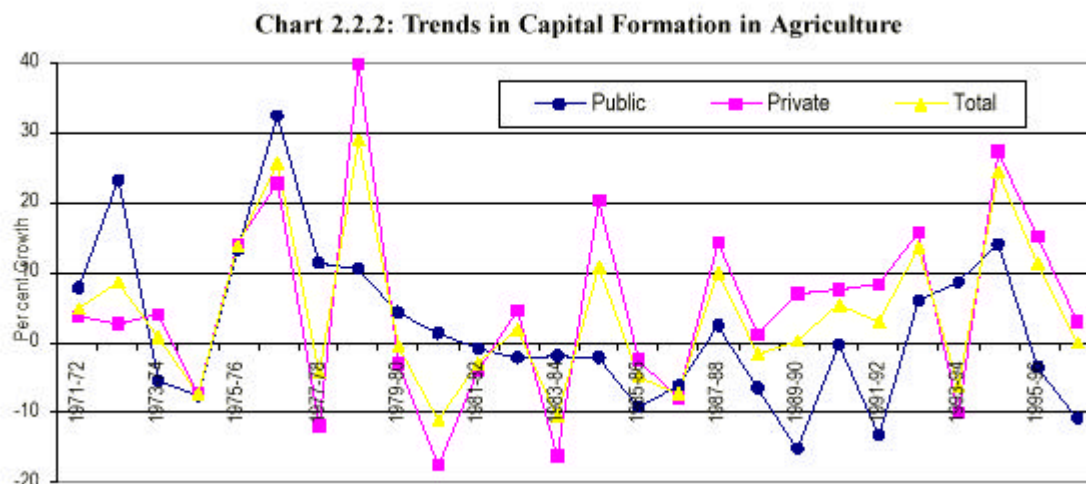
GCFA : Gross Capital Formation in Agriculture

Source : 1. National Accounts Statistics, various issues, CSO, Government of India.

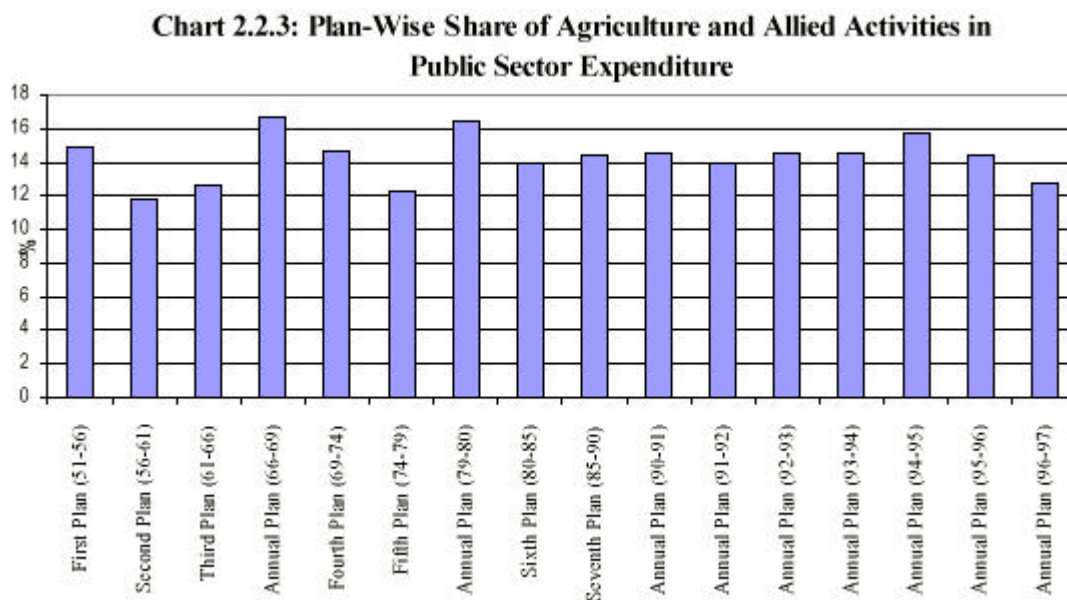
2. Agricultural Statistics at a Glance, Various Issues, Government of India.



What is more disturbing is the fact that GCF in the agricultural sector by the public sector declined at an annual average rate of 4.0 per cent and 1.9 per cent during the 1980s and the 1990s, respectively. As a result, the share of public sector in total capital formation in the sector declined to around 23.0 per cent during the nineties as against 32.0 per cent during the seventies. However, in the private sector, the decline was only marginal during eighties (-0.1 per cent) and it picked up at a moderate of 8.1 per cent in the nineties (Table 2.2.1 and Chart 2.2.2).



Under the various Plans, the share of agriculture and allied activities in public sector expenditure was only around 14.0 per cent (Chart 2.2.3). During the Ninth Plan (1997-2002), investment requirement in the agricultural sector is estimated at 1,54,900 crore, of which around 82,200 crore or 42 per cent is expected to come from the public sector (Centre and States) (Planning Commission, 1998). Given the current trends in public sector capital formation, it is doubtful whether the target will be achieved at the end of the Plan period.



There is a view among the agricultural economists that the lagged effect of decline of capital formation during the eighties has been one of the major reasons for the decelerated growth of the sector during the nineties (Mahendra Dev, 1998). Therefore, the subdued level of capital formation during the nineties can have an impact on agriculture production in the coming years. Apart from the sluggishness in capital formation at the national level, there are large inter-

regional variations in public investment on rural infrastructure, which probably accounts for differential growth of agriculture in various regions. Bhatia (1999) found that the index of rural infrastructure was the highest in Punjab followed by Kerala, Tamil Nadu and Haryana. However, in case of Rajasthan, Bihar, Madhya Pradesh, Orissa, Uttar Pradesh, West Bengal and Assam it was very low. Further, the study found a strong relationship between rural infrastructural development and level of per hectare yield of foodgrains as also value of output from agriculture. It is, therefore, recommended that development of infrastructure should be given top most priority by national, state and local self-governments. Ideally, we need to evolve a core investment programme for the country and economic criteria should guide in its implementation.

In the literature there is a lively debate on complementarity between public and private sector capital formation in agricultural sector. While Studies by Shetty (1990), Rao (1994), Dhawan and Yadav (1995), Dhawan (1996a), Dhawan (1996b), Alagh (1997) and Rao (1998) postulate or establish the complementarity between the public and private investment in agriculture, studies of Mishra and Chand (1995), Mishra and Hazell (1996), and Mishra (1998) refuted the existence of complementarity. On this issue, Rao (1998) opined that there is severe underestimate of public investment in agriculture, especially in case of rural electrification, rural roads, etc., which may be responsible for the empirical findings of non-existence of complementarity. Agriculture is basically a private activity in India and, hence, public investment has a crucial role to play in creating infrastructure in terms of irrigation, roads, markets, storage facilities, rural electrification and technology development, besides education and health (Thamarajakshi, 1999). Another view gaining ground in recent times is that the decline of capital formation in the public sector has been compensated by the private sector. Logically, the argument looks sound but its fallacy comes out when one examines the composition of private capital formation. Private sector capital formation is essentially taking place for short-term asset building and it is mainly in the areas of mechanisation, ground levelling, private irrigation, etc. However, public sector capital formation is mainly in the form of construction of dams, roads, marketing yards, rural electrification, etc, where private sector capital formation is hard to come in. Therefore, public sector capital formation needed to be augmented with a definite content and targeted focus, especially in case of rainfed areas, which lack not only in irrigation facilities, but also in other infrastructural facilities.

Here it may be mentioned that public spending in agriculture is a common feature in both the developed and developing countries. In a World Bank study, Blarcom, *et al*, (1993) found that in case of 40 developing countries, an average of 7.5 per cent (including subsidies) of total central government expenditure was allocated to agriculture during the period 1972 to 1988. And it formed around 10 per cent of net value of agricultural production. In case of a group of 15 developed countries, the share of government expenditure was around 3 per cent of total expenditure. However, it formed around 20 per cent of their net value of agricultural production.

Some studies suggests that the decline in the Incremental Capital Output Ratio (ICOR) and the concomitant increase in Marginal Efficiency of Capital (MEC) during the eighties has compensated the decline in capital formation during that decade (Mishra and Chand 1995, Alagh, 1997, Purohit and Reddy, 1999). However, this argument has been questioned by some other studies on the ground that why MEC, which improved during the eighties, deteriorated during the nineties (due to the decelerated growth of agricultural production and accelerated

growth of capital formation during the nineties) (Mallik, 1997 and Pulapare, 2000). As the estimation of ICOR and MEC are not very reliable, it is imprudent to conclude that the decline of capital formation has been compensated by improvement in efficiency of use of capital.

Rising subsidies on food, fertilisers, credit, etc., is said to be the factors limiting the growth of public sector investment. In general, subsidies distort resource allocation and hence, it need to be kept at the minimum. Well targeted subsidies for programmes like adoption of improved seeds, mechanisation, irrigation, etc., can play a valuable role in promoting agriculture growth. However, they need to be removed once their original purpose has been met. With the move towards reduction in subsidies on food and fertiliser in the recent Union Budget, Government can redirect the money for capital formation purpose. In fact what is need is prioritisation of the requirement of capital formation in different areas like watershed development, rural electrification, extension services, flood control, etc., where private sector investment is hard to come.

One major step taken for improving capital formation in the public sector is the creation of Rural Infrastructural Development Fund (RIDF) in 1995-96 in NABARD with a corpus of Rs.2000 crore, with the objective of providing funds to State Governments and State owned corporations to enable them to complete various types of rural infrastructure projects. Since 1995-96, the scheme continued in each succeeding years with enhancement of the volume of the fund; the last one being RIDF-VI announced in the Union Budget 2000-01 with a corpus of Rs.4,500 crores. The resources for the fund is contributed by the scheduled commercial banks to the extent of the shortfall the bank may post for meeting the priority sector lending targets. Of course, the creation of RIDF will improve the infrastructural facilities in various states. However, we would like to flag some issues associated with RIDF. First, RIDF is not an additional resource to the agriculture sector. Rather, it is a mechanism through which private sector resources (deposit) are diverted to the public sector. Had the banks met the stipulated target of priority sector lending, the resource flow would have been much more in the sector, especially at the private hands. In other words, RIDF basically involves the transfer of resources from the private sector to the public sector. Therefore, the efficiency in the utilisation of funds by the states may be lower than the efficiency in case of utilisation by the private sector (mainly farmers), had the banks met their priority sector targets. Second, though the NABARD sanctioned the fund to various State Governments, its disbursement is not impressive; only around 37.0 per cent of the sanctioned amount at the end of March 1999. Third, it provided the commercial banks a golden opportunity for parking their funds with ensured return without risk and that made the banks less interested in expanding their priority sector lending.

Based on the above discussion on capital formation, we identify the following priority tasks:

- ♦ ***Capital formation in the public sector should be augmented. Money saved from the reduction in subsidy for agricultural inputs should be utilised for this purpose.***
- ♦ ***In view of the resource constraints, capital formation requirements need to be prioritised. As ACRP gets operationalised, it would be possible to do prioritisation in a rational manner.***

- ◆ *Inter-state variations in capital formation need to be reduced by stepping up investments in backward regions.*
- ◆ *Delays in disbursement of funds under RIDF should be eliminated.*

2.3 Agricultural Credit

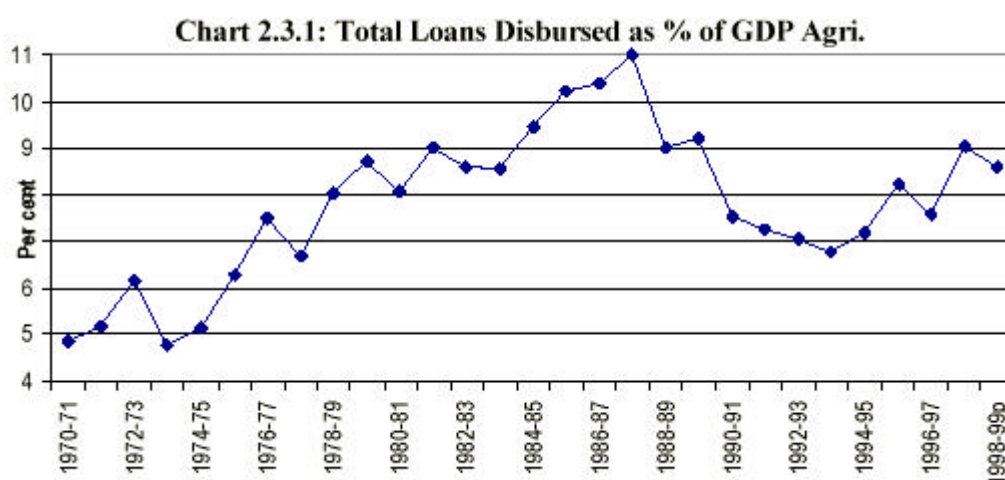
Credit is one of the important supply side factors which contributes to agricultural production. An efficient and effective rural credit delivery system is imperative for providing timely, adequate and equitable access to credit for raising agricultural productivity and incomes. Equitable access to institutional credit is important in the context of relative scarcity of credit and the high cost of informal credit. In India, the emphasis on agricultural credit has continued through progressive institutionalisation for providing timely and adequate credit to farmers at reasonable rates of interest. Broadly, over the years, India has followed three pronged strategy for developing rural credit, viz, i) promotion of institutional structure, ii) directed lending, and iii) concessional or subsidised credit (Rangarajan, 1996).

Table 2.3.1: Agricultural Credit: Growth, Per cent of GDP Agriculture and Per cent of Private Capital Formation

Period	Loans issued (Per cent per annum)	GDP Agri.* (Per cent per annum)	Loans as % of GDP Agri.	Term Loans as % of Private GCF
1970-71 to 1979-80	16.1	9.2	6.1	42.0
1980-81 to 1989-90	14.0	13.4	9.4	79.9
1990-91 to 1998-99	15.2	15.9	7.7	54.7
1971-72 to 1998-99	14.9	12.6	7.9	60.9

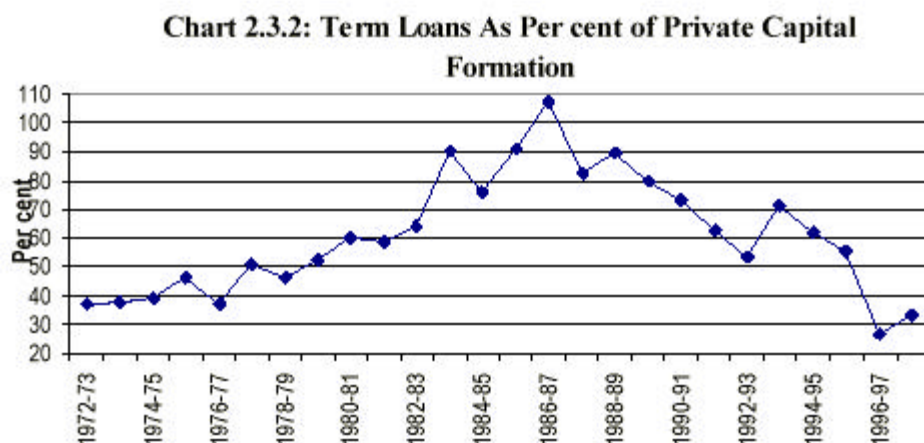
*: At Current prices.

GCF: Gross Capital formation.



There has been considerable progress in above three strategies, especially, we could develop a large institutional network, at different layers, for rural credit. The aggregate loan disbursements for agriculture and allied activities by the co-operatives, commercial banks and Regional Rural Banks (RRBs) together rose by 14.9 per cent per annum during the last three decades (from 1970-71 to 1998-99). However, during the eighties and nineties, the rate of growth slowed down as compared to the seventies (Table 2.3.1). As a result, per cent of total loans to GDP in agriculture declined during the nineties to 7.7 from 9.4 in the eighties (Chart 2.3.1). Lower expansion of credit in relation to the requirements for private sector capital formation is also evident. The share of term loans in private sector capital formation declined during the nineties to 54.7 per cent from 79.9 per cent in the eighties (Table 2.3.1 and Chart 2.3.2).

Over the years, rural credit system has been suffering from a number of weaknesses like, limited outreach, skewness in the availability of credit in different regions, sectors and sections of the farming community, lower recovery of loans and growing non-performing assets, loss making institutions, etc. In this context, Mujumdar (1999) observed that "It is an irony of economic history that India which was a pioneer in evolving its own brand of institutional framework for rural credit today finds its entire rural credit system in a moribund state" (pp.1577).



Poor recovery of loans and the consequent rise in non-performing assets (NPA) is a matter of grave concern. There is a general perception that higher NPA of the banking system is mainly on account of the priority sector advances. This is not entirely true as the data show that the share of gross NPAs in the priority sector in the total gross NPAs of the commercial banks is only around 46.4 per cent in 1998 and it in fact declined from the level of 48.3 per cent in 1996. As the priority sector accounts for around 30-32 per cent of net bank credit of the commercial banks, the above share need not be taken as extremely high. In fact, in recent times, NPAs are increasingly occurring on borrowal accounts of industrial sector. The proportion of gross NPA to priority sector advances of the public sector banks was around 23.0 per cent in 1998, which is higher than around 13.0 per cent in case of non-priority advances (Reserve Bank of India, 1999b). Hence, the focus of commercial banks is on recovery of advances. Reports from various parts of the country indicate that forceful recovery of loans by banks is putting undue hardship on the

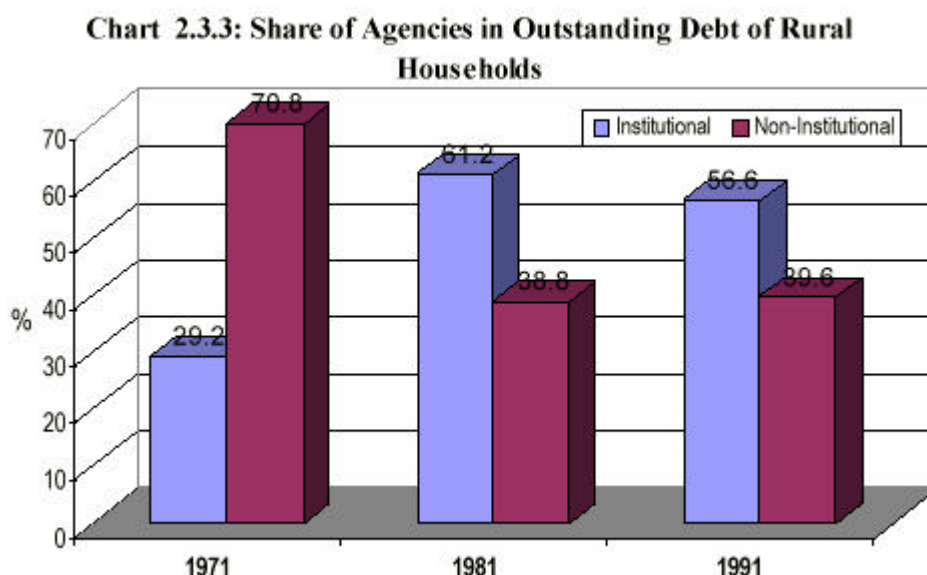
poor and they are even forming associations to fight against the recovery operations of the banks. They argue that when the big industrialists are left free from the repayment of loans, why the poor people are being targeted and harassed. After the write-off of loans under the Agricultural and Rural Debt Relief Scheme, 1990, people are still under the impression that they need not pay back the loans taken from the financial institutions. Therefore, it is essential that people are to be educated about the need to recover loans for recycling the loans.

Despite having a wide network of rural branches in the country and implementation of many schemes and programmes for expansion of credit (targeted lending) for agriculture and rural development, a large number of the very poor people continue to remain outside the fold of the formal banking system. The All India Debt and Investment Survey 1991-92 shows that during the eighties there was a decline in the share of institutional agencies in cash dues of rural households by 4.6 percentage points to 56.6 per cent as against a rise of 32 percentage points to 61.2 per cent during the seventies. Thus, the rural households still seem to depend on money lenders, landlords and relatives for a significant part of their credit. In case of non-cultivators, the share of institutional agencies was only 49.9 per cent in 1991. The decline in the institutional outreach during the eighties is mainly on account of decline in the share of co-operatives from 28.6 per cent in 1981 to 18.6 per cent in 1991. Correspondingly, the shares of traders and professional money lenders have increased (Table 2.3.2 and Chart 2.3.3). What is more revealing is the fact that the share of institutional agencies declined at a time when the proportion of rural households reported debt in 1991 increased to 32 per cent from 19.4 per cent in 1981. It is hard to believe that the outreach could have increased substantially during the nineties given the non-expansion of branch network and cautious attitude followed by the banks on account of financial sector reforms, which focussed on profitability of operations.

Table 2.3.2: Distribution of Cash Dues Outstanding by Credit Agencies to Rural Households (as on end June)

Credit Agency	(Per cent)		
	1971	1981	1991
I. Institutional - Total	29.2	61.2	56.6
1. Commercial Banks	2.2	28.0	29.0
2. Co-operatives	20.1	28.6	18.6
3. Government	6.7	4.0	5.7
4. Insurance	0.1	0.3	0.5
5. Provident Fund	0.1	0.3	0.9
6. Others	-	-	1.9
II. Non-Institutional - Total	70.8	38.8	39.6
1. Professional Moneylender	13.8	8.3	9.4
2. Agricultural Moneylender	23.1	8.6	6.3
3. Relatives/Friends	13.8	9.0	6.7
4. Landlords	8.6	4.0	4.0
5. Traders	8.7	3.4	7.
6. Doctors, Lawyers, etc.	-	-	11.2
7. Other Sources	2.8	4.9	4.9
III. Sources not specified	-	0.6	3.8

Source: All India Debt and Investment Survey, 1991-92, Indebtedness of Rural Households as on 30.6.1991, Report 2 (Part-1), NSS forty-eighth Round, NSSO, GOI, 1977, reported in Reserve Bank of India Bulletin, February 2000.



In this context, a World Bank study carried out in a district in Eastern Rajasthan reveals that the share of institutional agencies in the availment of credit was just 16 per cent among the surveyed people below the poverty line (World Bank, 1995). Further, during the nineties, public sector banks could not meet their agricultural credit target of 18 per cent of net bank credit. Their achievement was only 15.7 per cent during the nineties. The Report of the High-Level Committee on Agricultural Credit Through Commercial Banks (1997) (Chairman: Shri. R.V. Gupta) also found that there is a substantial unfulfilled demand for crop loans, which is being met either by the money lenders or leading to the usage of lower inputs. However, the Committee recommended for non stipulation of credit targets. Once the recommendation is accepted it will make agricultural credit on equal par with credit to other sectors. Given the inherent weakness of the agricultural sector (susceptible to the vagaries of monsoon, operation of the law of diminishing returns and the general policy bias against the sector), it may not be appropriate to treat the sector on equal par with other sectors where returns are much higher than agriculture. Further, if this recommendation is accepted, the Government and the Reserve Bank will be left with no policy instrument for increasing the flow of credit to the agriculture. As informal credit is very costly as compared to the institutional sources and the existing set-up largely serves well-off farmers, the reach of the institution needs to be further improved especially to small and marginal farmers. Credit targeting can ensure the availability of credit to those sections of the society.

Along with credit targeting, concessionality in interest rates has been an instrument for increasing the flow of credit to the agricultural credit. There is a valid reason for following such a policy: "principal justification for charging lower interest rates to certain category of borrowers was that the farm based investment activity in the short-run does not always yield a return which

enables regular servicing of loans and at the same time meet the minimum consumption requirements" (Reserve Bank of India (1971). However, the Report of the Committee on the Financial System (1991) suggested that it is timely and adequacy of the credit that is more important than the cost of credit. Subsequently, following the financial sector reforms and de-regulation of interest rates in the economy, the concessional element in agricultural credit has been gradually wiped out. This is done by giving freedom to commercial banks, RRBs and co-operatives to fix their own interest rates on loans of amount. The only stipulation now is in respect of commercial banks that the rate of interest on loans below Rs.2 Lakhs should not exceed the Prime Lending Rate (PLR) of the respective banks. As PLR of banks are decided purely in terms of commercial considerations, the above stipulation does not provide any concessionality in lending.

With the rising rural income and agricultural exports, agricultural output mix is likely to undergo radical changes in the coming years which would substantially increase the demands for rural credit. The investment needs for the production of highly income elastic agricultural products such as dairying and livestock, horticulture, farm-forestry and agro forestry, which are more land saving and capital intensive, would rise much faster than before. Similarly, with the liberalisation of agricultural exports, the agricultural sector will be more commercialised and capital intensive, particularly in area like horticulture, floriculture, aquaculture, agro-industries, etc. Since many of the emerging activities are land saving in character, the income earning prospects for small and marginal farmers can be improved by providing requisite credit and technical expertise. Owing to these factors rural credit has to expand at a rate faster than in the recent past.

In this context, the role of micro credit comes into picture. Major reasons for the lack of interest of formal financial institutions in extending rural credit are high transaction cost involved in small loan accounts and poor recovery of loans. As a solution, a new mode of delivery of credit through Self-help Groups (SHGs) and Voluntary Organisations has been emphasised in recent times. In fact, micro credit is considered as the last hope for rural India. The early results of linking SHGs with banks, which launched by NABARD during 1992-93, is very encouraging. By the end of March 1999, 32,995 SHGs have been linked with banks, with bank credit of the order of Rs. 57 crores. However, the linkage programme was highly skewed in respect of regions and institutions. Region-wise, Southern Region accounted for about 65 per cent of the SHGs financed by the NABARD, primarily because of the strong presence of NGOs in that region. In case of northern region, the share was just 1 per cent. Further, 60 per cent of the financing is done through commercial banks and another 35 per cent through RRBs. The share of co-operatives, which has the largest network of branches, was just 4 per cent (NABARD, 1999a). NABARD envisages to cover at least one-third of the rural poor population by the year 2008 through one million SHGs (NABARD, 1999b). Measures are being taken now to bring micro-credit as an integral part of banks' corporate credit plan (Reserve Bank of India, 2000a). Further, in their report, Micro Credit Special Cell in the Reserve Bank, inter alia, suggested that 5 per cent of fresh net bank credit (50 per cent of fresh weaker section lending) should be made through micro credit lending procedure in a gradual manner (Reserve Bank of India, 2000b).

From the above discussion on rural credit, the following priority tasks are identified:

- ♦ *Increase the outreach of the formal financial institutions, especially to the small and marginal farmers.*
- ♦ *Continuation of credit targeting for ensuring adequacy of credit in the agricultural sector*
- ♦ *Progressively link SHGs with formal credit institutions for reducing transaction cost and high recovery*

2.4 Agricultural Insurance

In the context of increasing commercialisation and globalisation, the scope and relevance of agricultural insurance are not widely understood in India. Crop insurance, which is generally restricted to field crops, is generally considered synonymous with agricultural insurance. However, agricultural insurance covers a wide spectrum of activities like horticulture, plantations, livestock, poultry, aquaculture, sericulture, etc. Further, it extends to the entire production process including post-harvest storage, processing and transportation of produce to the final markets.

Agricultural insurance has many advantages. First, as the agricultural sector is not well organised on institutional lines, it can help agriculture to develop through institutionalised channels and assist in speeding up the process of commercialisation of the sector. Second, agricultural insurance can play a distinct role in securing credit from institutional sources as it provides security to the lending institutions. Third, it provides strength to farmers for a better deal in respect of interest rates in a liberalised interest rate regime. Four, it can ensure better recovery of loans as the credit agency would receive the payment from the insurance company in the event of production risk. Five, crop insurance has relevance for improving agricultural technology as with the security of insurance, farmers might be more willing to experiment with new technology. Six, agricultural insurance is an efficient instrument and an institutionalised mechanism for dealing with problems of natural calamities like drought, flood, etc., rather than providing *ad hoc* aid or relief measures (UNCATD, 1994).

In a country like India, where agricultural production has been subjected to vagaries of weather and large-scale damages due to attack of pests and diseases, agricultural insurance has to assume the role of a very vital institution for the stable growth of the sector. However, the country has failed miserably in this area as, till recently, the Government did not pay much attention on developing a well-designed agricultural insurance scheme. Suicidal deaths of many farmers in recent years in different parts of the country (especially in Andhra Pradesh and Maharashtra) could have been avoided had there been a well-designed crop insurance scheme. It is true that there had been a crop insurance scheme in India by name 'Comprehensive Crop Insurance Scheme', which started in 1985. However, it was not comprehensive as its name suggests as its coverage was very limited in terms of crops, areas and sum insured. Table 2.4.1 shows that the area covered by the scheme is less than one per cent of gross cropped area. However, on account of fixation of premium at unrealistically low levels, the loss ratio was over 300 per cent (average during 1995-96 to 1997-98) in India (higher claims than the premium collected), which is very high in comparison with other developing countries (UNCTAD, 1994).

Table 2.4.1: Coverage of Comprehensive Crop Insurance Scheme

Season	No. of Farmers Covered (Lakhs)	Area Covered (Lakh hectare)	Sum Insured (Rs. Crore)	Total Insurance Charges (Rs. Crore)	Claims Paid (Rs. Crore)	Loss Ratio* (per cent)
Rabi 1995-96	8.8	12.8	379.7	6.9	16.6	240.6
Kharif 1996	48.5	80.7	1973.4	30.4	151.3	497.7
Rabi 1996-97	10.0	14.0	493.2	8.9	20.7	232.6
Kharif 1997	51.4	83.5	2229.6	34.3	173.0	504.4
Rabi 1997-98	8.7	13.5	400.3	7.2	13.9	193.1
Kharif 1998	52.9	82.1	2444.2	38.3	-	-

*: Loss ratio is claims paid as ratio of total insurance charges (premium).

Source: Report on Currency and Finance, various issues, Reserve Bank of India.

Recently, government introduced a new Scheme titled 'National Agricultural Insurance Scheme' from Rabi 1999-2000. The scheme envisages coverage of all the food crops (cereals and pulses), oilseeds and annual horticultural/commercial crops. The premium rates vary from 1.5 per cent to 3.5 per cent (of sum insured) for food crops and cereals. Small and marginal farmers will be entitled to subsidy of 50 per cent of the premium. However, the government propose to phase out the premium subsidy over a period of 5 years. The Government has also decided to set up an exclusive organisation for implementation of the new scheme in due course.

Fixation of insurance premium at realistic level is essential for the commercial viability of any programme of agricultural insurance. However, in view of the poor financial position of small and marginal cultivators, most of the developing countries are providing subsidy on the premium to be paid by them. Depending upon the fiscal situation, government can give some amount of subsidy for small and marginal farmers. But it needs to be paid directly to the insurance agency so that the agency can work on commercial basis. The subsidy element can be gradually removed once the insurance programme becomes successful. Ideally, along with the privatisation of the insurance sector, private participation in crop insurance has to be encouraged so that it would not create a burden on the government. In countries like Mexico and Venezuela private insurance companies have been successful in crop insurance. While privatising, to ensure fairness, government can fix the premium and other related conditions without discouraging the interest of the agency. The advantage of private insurance is their operational flexibility to deal with the needs of the sector and to evolve or modify product design to meet the demands of the farmers. The experience of various countries in agricultural insurance reveals that delivery and servicing costs are high and it in turn inhibiting its expansion. Therefore, it is essential to evolve strategies to minimise the cost. One of the ways to reduce the administrative costs could be to establish links with other agencies such as credit institutions, trade associations and marketing boards so that their infrastructural facilities could be used for servicing the insurance provided.

Here it may be noted that crop insurance is not a panacea for the problems of the agricultural sector. It can not increase productivity and is not a substitute for effective network of extension services, supply of inputs, provision of storage and marketing facilities (UNCTAD, 1994). Crop

insurance need to be considered as only one among the various alternatives available for reducing the difficulties of the farming community. A long-term solution for the instabilities in farm income has to be found in diversification of cropping pattern, development of non-farm sector, which is integrated with the farm sector, and provision of adequate extension services to tackle calamities at the earliest without much damage to the crops. In this context, farm co-operatives can take care of some of the adversities and, hence, they need to be promoted. Here it may be mentioned that Crop insurance covers only production risk and not market risk arising out of fluctuations in prices and unremunerative prices. Therefore, direct government intervention is needed to tackle the problem of price fluctuations. Development of futures market also can impart some element of stability to market prices (UNCTAD, 1994).

On crop insurance, the following priority tasks are identified:

- ♦ *Enhance the coverage of agricultural insurance scheme to the entire production process including post-harvest storage and processing.*
- ♦ *Integration of agricultural insurance with credit institutions.*
- ♦ *Encourage private participation in crop insurance*

2.5 Globalisation

We now come to the role of the government in the context of opening up of Indian agriculture to global markets. From a historical perspective, it can be observed that till the late eighties agricultural sector in India was relatively closed as the export orientation was confined to only some commercial crops like spices, tea, coffee, etc. and imports were largely restricted. However, during the period since then the degree of export orientation increased considerably with the removal of some of the restrictions/controls on export of commodities. Till recently, imports of agricultural commodities have been largely restricted with quantitative restrictions and high level of tariffs. As on April 1, 2000, import of around 700 items belonging to the agricultural sector were subjected to quantitative restrictions. However, a significant step has been taken for the liberalisation of imports in the Export-Import Policy of 2000-01 with the removal of QRs on 228 agricultural items. The important items on which the QRs have been removed are dairy products, flours of cereals, coffee, tea and tobacco. Here it may be noted that even after the removal of QRs, India can restrict the import of agricultural commodities by fixing higher import duties, as tariff commitment on most of these agricultural items, which India has submitted to the WTO, are very high, except in case of some items like rice, skimmed milk powder, etc. (Mehta, 2000, NCAER, 2000).

Table 2.5.1: Share of Agricultural Exports in GDP in India

	(Rs.crore at current prices)				
	1970-71	1980-81	1990-91	1995-96	1998-99
1. GDP (Total)	39708	122427	477814	1006286	1612383
2. GDP in Agriculture*	16821	42466	135162	255613	428680

3. GDP-Rest of the Economy@	22887	79961	342652	750673	1183703
4. Total Exports	1535	6711	32558	106353	141604
5. Agricultural Exports	487	2057	6019	20344	25225
6. Exports-Rest of the Economy@@	1048	4654	26539	86009	116379

Per cent Share

a) % of Agri.Exports in GDP (Total)	1.2	1.7	1.3	2.0	1.6
b) % of Agri.Exports in GDP Agri.	2.9	4.8	4.5	8.0	5.9
c) % of Total Exports in GDP (Total)	3.9	5.5	6.8	10.6	8.8
d) % of Exports from the rest of Economy in GDP Agriculture	4.6	5.8	7.7	11.5	9.8

Note: * : GDP originated in agriculture, forestry and fishery

@ : Total GDP minus the GDP originated in agriculture.

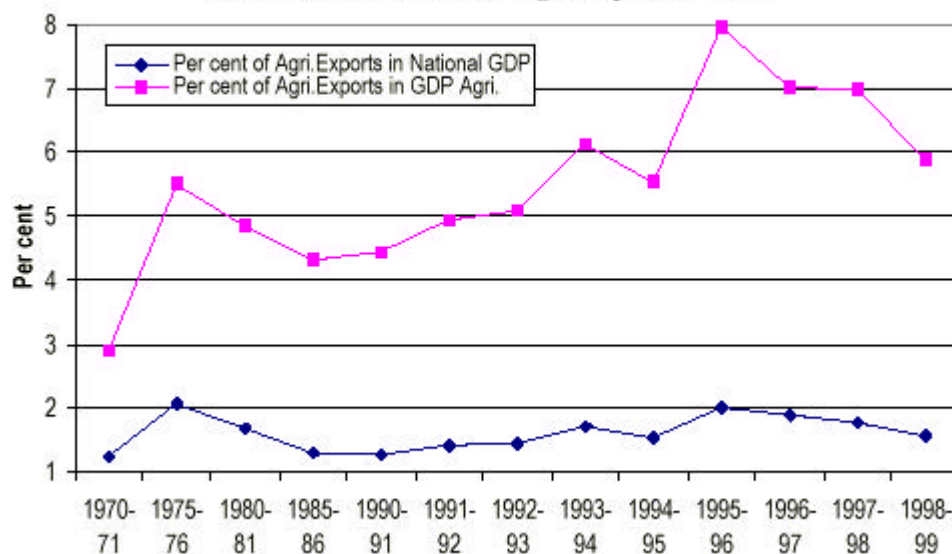
@@ : Total Exports minus the export of agricultural products.

Source: 1. National Accounts Statistics, various issues, CSO, New Delhi.

2. Economic Survey, various issues, Government of India, New Delhi.

The share of agricultural exports in GDP (both in total GDP and GDP originated in agriculture) would indicate three major aspects, namely, i) the degree of openness or outward-orientation of the agricultural sector in regard to the export activity; ii) the nature of agricultural trade strategies adopted in the country; and iii) supply capacity of the agricultural sector as regards exports. An analysis of these aspects is carried out based on Table 2.5.1. It can be noted from the Table that after a marginal rise in the shares of agricultural exports in total GDP and in GDP originated through the agricultural sector during the seventies, the shares were on the decline in the eighties. However, since the beginning of the nineties there is a perceptible rise in the shares: the share in total GDP rose from 1.3 per cent in 1990-91 to 2.0 per cent in 1995-96 but since then it declined to 1.6 per cent in 1998-99. In case of the share of agricultural exports in GDP originated from the agricultural sector, the rise was from 4.5 per cent to 8.0 per cent and then decelerated to 5.9 per cent, during the above period. From the above observations, it can be inferred that the degree of openness or outward orientation of the agricultural sector, with regard to exports, has increased in recent times, albeit a marginal decline occurred since 1995-96. It reflects the effects of the liberalisation of agricultural exports and improvement in the supply capacity of the economy in recent times (Chart 2.5.1). Table 2.5.1 further reveals that agricultural sector is less outward-oriented than the economy as a whole. This is evident from the share of total exports from India in GDP (total). The share was 8.8 per cent in 1998-99, which is higher than the share of agricultural exports in GDP originated from the agricultural sector at 5.9 per cent.

Chart 2.5.1: Per cent of Agri.Exports in GDP



From a phase of gradual export orientation, the agricultural sector in India is likely to enter into a new phase of globalisation with the implementation of the various provisions of WTO (as and when they are made applicable to India). Here it is worthwhile to note that there is no country in the world which has globalised its agricultural sector in the true sense of the term. Even in the advanced market economy countries, agricultural sector is relatively protected. However, with the implementation of the various provisions of WTO agreement, especially the provisions relating to removal of quantitative restrictions, it is expected that a beginning will be made in this direction.

What will be the implication of globalisation of agriculture sector? To find an answer to the above question, here we offer the findings from empirical studies on the subject: A study by Subramanian (1993) revealed that with the liberalisation of trade the movement of terms of trade against agricultural can be moderated. Trade liberalisation will lead to higher price transmission elasticities for all unprocessed commodities except coarse cereals. The author, however, cautioned against extending trade liberalisation to commodities such as edible oils, sugar and processed food as they are highly protected and in cases of those commodities whose per capita availability is low. Parikh, *et al.*, (1995) revealed the following: i) trade liberalisation in the medium run increases allocative efficiency within the agriculture sector and between agricultural and non-agricultural sectors, ii) agricultural liberalisation increases output of all agricultural commodities except coarse grains and other foods, iii) liberalisation leads to higher volume of exports of all agricultural goods, except coarse grains and iv) prices of several agricultural commodities, which were disprotected, would rise with trade liberalisation. Gulati and Sharma (1997), in terms of resource use efficiency (RUE), found that area and production of rice, wheat, maize, sorghum, chickpea and cotton are likely to expand when the international trade in agriculture is completely liberalised. On the other hand, groundnut, rapeseed-mustard and sunflower may have to face deceleration in their future expansion if trade is opened up (there may even be a contraction). Chand (1998) found that imports to India would not be attractive in case of rice, tea, sunflower oil and cotton. There was a strong possibility of rise in imports of

sugar and edible oils after the removal of QRs. The study observed that dismantling the trade barriers on imports would increase volatility of Indian prices and farm incomes. On the positive side, the removal of QRs would promote competition in the domestic market, which in turn would be beneficial to the consumers. Gulati (1998) found that globalisation of the economy, including agriculture, offers an opportunity to correct the anti-agriculture bias in Indian trade policies that have been in existence since 1950s. The study further revealed that agriculture could move on to a higher growth trajectory if supply side bottlenecks are freed, and a protective cover is accorded to the poor. Bharadwaj, *et al*, (1998) found that opening up of the economy was likely to benefit the agriculture and agro-based industries.

In the light of the findings of the above studies, we identify the following issues to be addressed in the context of globalisation of the agricultural sector. They are: i) self-sufficiency in production, ii) price stability, iii) cropping pattern iv) adverse effects on weaker sections and v) WTO commitments. These issues are examined below.

Theoretically, if a country globalises its agricultural sector, it cannot achieve the objective of self-sufficiency in production. This is because of the fact that with globalisation, countries will be forced to concentrate on production of those commodities in which they have comparative advantage in production. For countries like India, with large population and lower purchasing power, the impact of globalisation on availability of food at relatively lower prices is of concern both politically and ethically. Hence, food self-sufficiency at the national level, not necessarily 100 per cent, is desirable so that the reliance on trade can be kept within limits (Parikh, 1999). Undue concentration on production of some agricultural commodities in the long-term may create serious consequences for the quality of land, ecological balance and employment opportunities. The experience of Punjab and Haryana on account of undue specialisation in the production of rice and wheat is an example in this respect. In view of the likely consequences, it may not be desirable to globalise the sector entirely. Rather, we need to judiciously globalise the sector so as to avoid the undesirable outcomes.

Another issue related to globalisation is the likely price instability in the domestic market due to the convergence of domestic prices with the international prices. Literature indicates that given the high level of instability of commodity prices in the international market, mainly due to variations in crop production and speculative nature of the market, it is quite likely that prices of commodities in the domestic market will be highly unstable which will adversely affect both the producers and the consumers. Hence, dismantling of trade barriers is likely to increase volatility of domestic prices and farm incomes (Nayyar and Sen, 1994). Further, domestic prices will be more volatile when there is an incidence of dumping by countries having bumper harvest (Chand, 1998). Therefore, due precaution has to be taken in case of large-scale import of agricultural commodities.

Freeing trade in agricultural commodities is likely to change the cropping pattern in the country depending upon the level of comparative advantage in the production of commodities. As India has comparative advantage in production of commodities like rice, wheat, maize, sorghum, chickpea and cotton (Gulati, *et al*, 1994), trade liberalisation will increase their exports, which in turn may lead to expansion of area under these crops. At present, these crops are disprotected or indirectly taxed due to the restriction on exports. However, with liberalisation of

trade these commodities will be able to get higher prices and that may promote larger cultivation. However, in case of oilseeds there may be a deceleration in their future expansion as they are not having comparative advantage and they have been getting much higher level of incentives than what they are likely to get under a free-trade scenario (Gulati and Sharma, 1997). With liberalisation of agricultural trade the country can import oilseeds at lower price than the domestic price. Hence, achieving self-sufficiency in oilseeds production may not be desirable given the huge cost involved in it.

Globalisation of the sector may have its adverse effects on certain areas, some crops and some group of people. It has been indicated in the literature that with export promotion and globalisation, the benefits will be accrued to only some areas which are well endowed in terms of resources, some crops which are having comparative advantage in production and some sections of the population who are producing the exporting commodities. Other areas, crops and people are unlikely to be benefited from the globalisation process. In other words, the benefits of globalisation process may not be neutral to areas, crops and people. Further, as globalisation may raise the prices of some of the essential commodities, it will have adverse welfare consequences for the people who are not engaged in the agricultural sector.

The country's commitment to WTO, which in a way may facilitate the process of globalisation, is likely to have some consequences for the sector. Currently, the commitment for reduction of subsidy may not affect the quantum of subsidy given to the farmers. However, once the exemptions provided to the developing countries are withdrawn, there can be some pressure for reduction of subsidy, especially the subsidy for food procurement and its distribution through the PDS. The commitments for removal of QRs and reducing the import duty and also for increasing the quantum of imports are likely to increase imports and depress the domestic prices, especially of those commodities in which India does not enjoy comparative advantage.

Despite some of the trade liberalisation measure, foodgrains sector still remains largely controlled and insulated from the global markets, in view of the food security objective. In case of cash crops, exports are allowed when there is enough surplus and are imported when there is a net deficit. Hence, there is a view that agricultural trade is still taking place as a 'residual' between domestic demand and supply rather than as a policy instrument to integrate domestic agriculture with the world agriculture (Gulati, 1998). Ideally, agricultural export and import policies should move in tandem so as to avoid any distortions in domestic prices. However, during the last few years while the agricultural exports have been liberalised, restriction/controls on imports have remained more or less unchanged (Jeromi, 1999). While the liberalisation of exports resulted in rise in domestic prices of some of the commodities (example, onion and potato), the restriction on imports denied access to commodities from abroad. This miss-match in agricultural export-import policy was on account of the undue obsession to remain self-sufficient in all agricultural commodities. However, given the fact that no country in the world can have comparative advantage in production of all the commodities required by it, the restrictions on imports in the face of liberalisation of exports will not be beneficial in a liberalised economic environment (Chand, 1988). Hence, there is a need to continue with the liberalisation of trade in agricultural commodities so as to provide a level playing field for the agricultural sector with the industrial sector. The removal of QRs on some of the agricultural commodities announced in the Export-Import Policy 2000-01 would greatly reduce the miss-match in the policies.

The following priority tasks are identified for the government to help Indian agriculture adjust to globalisation:

- ◆ *Food self-sufficiency at the national level is desirable so that the reliance on trade can be kept within limits.*
- ◆ *Safetynets are needed to protect the interests of crops, people and regions which are likely to be affected by globalisation.*
- ◆ *Precautions on imports in view of the removal of quantitative restrictions.*
- ◆ *Agricultural export policies need to be synchronised with the import policies to avoid price fluctuations. There is a need for sequencing of measures. In view of the removal of quantitative restriction in the coming days, tariffication process needs to be done judiciously.*

2.6 Watershed Development

According to Planning Commission (1997b) about 9.6 million hectares of arable land and 6.9 million hectares of non-arable land have been treated under various watershed programmes. There are still about 60 million hectares of arable land and 15 million hectares of non-arable land which remain to be covered. Studies reveals that watershed development programmes undertaken thus far, have a mixed story of success and failure. The impact assessment shows a great degree of variation in achievement from project to project, depending on location, level and nature of community participation, caste and class structure, land tenure, nature of technology propagated, institutional arrangements, infrastructure, research, as well as extension and training support, etc. Several watershed projects have helped improve soil moisture, cropping intensity, crop yields and employment. [Nagaraja (1996), Deshpande and Reddy (1991)].

The experience of some successful watershed projects in India and abroad shows that people's effective participation in the planning, execution, monitoring and maintenance of project is essential for success. The government should create a proper legal and political environment for people's effective participation, including those of women and the landless. But it should be basically a people's programme, the role of government being limited to providing only technical guidance, basic infrastructure and limited finance, if necessary. Women have an important role in maintaining the household livelihood system. In poor families, they are largely responsible for collection of food, fuel & fodder. Therefore, involvement of women in Watershed Development Programme would be crucial. Further, NGOs are generally considered better than bureaucracies for enlisting people's participation in watershed development. Their role is to organise training for self-help groups and also to create awareness among the people for watershed management for sustainable development. Ralegaon Siddhi, MYRADA and several other voluntary organisations have effectively demonstrated the positive role of NGO's in watershed development. Panchayat Raj Institutions can play a vital role in watershed development. However, Panchayat Acts of various states do not specifically assign any role to the panchayats for implementation of watershed projects. There is need for an effective devolution of

responsibilities, finances and administrative powers to panchayats for the purpose. Particularly, the assets and infrastructure created in watersheds must be maintained by Panchayats (Planning Commission, 1997b).

At present watershed development and soil conservation have been treated as a sectoral activity of erosion control. This need to be changed and follow a holistic approach, encompassing land, water, animal and human resources to meet the water and bio-mass needs of the people on sustainable basis. The emphasis should change from mere soil conservation to land husbandry. The potentials of all farm and non-farm activities for the creation of adequate livelihood, income and employment opportunities in each watershed should be explored and utilised. Besides, the watershed development programmes would gradually shift from Centre to State or even local bodies and ultimately the people themselves should plan, execute and maintain them (Planning Commission, 1997b).

Planning Commission (1997b) estimates show that the area available for treatment in the next 25 years would be 60 million hectares of arable land and 15 million hectares of non-arable land. Hence, to cover the entire treatable area of 75 million hectares in about 25 years in a phased manner, about 12 million hectares of arable land and 3 million hectares of non-arable land to be treated in each Five Year Plan. This would require the Government to spend at least Rs. 7,780 crore and another Rs.13,070 crore by the people at constant prices (Table 2.6.1).

Table 2.6.1:Physical and Financial Targets of Perspective Plan for Watershed Development

Plan Period	Area to be covered by (Million hectare)		Cost Per Hectare (Rs.)	Total Cost at 1994-95 Prices (Rs.Crore)		
	Govt.	People's initiative		Govt.	People	Total
9 th Plan	10	5	3000	3000	1500	4500
10 th Plan	7	8	3000	2100	2400	4500
11 th Plan	5	10	2800	1400	2800	4200
12 th Plan	3	12	2600	780	3120	3900
13 th Plan	2	13	2500	500	3250	3750
Total	27	48	--	7780	13070	20850

Source: Planning Commission (1997b).

It is necessary to point out here that although the short term objectives of different watershed programmes vary widely, the overall long-term objective of all such programmes is to improve the livelihood system of rural people in rainfed areas through i) improvement in environment/ecology by conserving and developing natural resources namely, land, water, perennial vegetation etc., ii) improvement in production and productivity of crops, animals, trees etc. and iii) improvement in income and employment opportunities for the people, particularly the landless poor and women.

In case of watershed development, the following aspects need to be considered:

- ◆ ***Development and diffusion of appropriate location specific technologies and infrastructure, with people's participation in various rainfed areas.***

- ♦ *Watershed programmes should be more people oriented and panchayats should be actively encouraged with financial and administrative powers.*

2.7 Research and Development

Besides land and water resources, one of the major issues relating to overcoming limits to growth is the low productivity of Indian agriculture. There is a view that productivity levels in India have reached a plateau, especially in the green revolution areas (Rao and Gulati, 1994). To an extent this is evident from the deceleration in the growth rates of yields of most of the crops during the nineties. This has serious implications for the future growth of agricultural production, especially in view of the almost stagnation in area under cultivation and the resultant deceleration in production growth during the nineties (Table 2.7.1).

Table 2.7.1: Trend Growth Rate of Area, Production and Yield of Important Crops*

Crops	(Per cent per annum)					
	Area		Production		Yield	
	80's	90's	80's	90's	80's	90's
I. All Crops	0.1	0.4	3.2	2.2	2.6	1.4
II. Foodgrains	-0.2	-0.1	2.9	1.8	2.7	1.4
III. Non-Foodgrains	1.1	1.5	3.8	3.3	2.3	1.4
i. Rice	0.3	0.5	3.6	1.9	3.2	1.3
ii. Wheat	0.5	1.7	3.6	3.1	3.1	1.6
iii. Coarse Cereals	-1.4	-1.8	0.4	0.2	1.7	2.0
iv. Pulses	-0.1	-0.2	1.5	1.0	1.6	1.7
v. Oilseeds	2.4	0.8	5.5	3.4	2.9	2.6
vi. Sugarcane	1.5	1.8	2.7	2.5	1.2	0.7
vii. Cotton	-1.3	3.3	2.8	1.7	4.1	-2.0

Notes : *: Estimated based on semi-log regression equation.

-: 80's cover the period 1980-81 to 1989-90.

-: In case of production, 90s cover 1990-91 to 1999-2000. In case of area and yield 90's cover the period 1990-91 to 1998-99.

Though India is one among the major producers of agricultural commodities in the world, the yield levels, here, for a number of commodities like paddy, wheat, groundnut, cotton, jute, etc., are far lower than the yield levels in major producing countries and in case of some crops it is even lower than the world average (Table 2.7.2).

Table 2.7.2: Yield of Important Crops in Major Producing Countries in 1997

											(Kg./ha.)
Paddy		Wheat		Groundnut		Sugarcane		Cotton		Jute	
Country	Yield	Country	Yield	Country	Yield	Country	Yield	Country	Yield	Country	Yield
China	6331	China	4087	China	2574	Brazil	69021	China	943	Banga.	1577
Indonesia	4561	France	6530	Nigeria	1124	China	75982	USA	769	China	2517
Pakistan	2827	USA	2673	USA	2828	Thailand	55878	Pakistan	552	Thailand	3548
Philippi.	2933	Australia	1712	Indonesia	1519	Mexico	72734	Turkey	1065	Myanmar	939
Thailand	2143	Canada	2128	Sudan	762	Australia	97337	Argentina	368	Brazil	1714
India	2915	India	2654	India	988	India	69737	India	321	India	1830

World	3827	World	2686	World	1273	World	63324	World	584	World	1734
India %											
Of World	76.2		98.8		77.6		110.1		55.0		105.5

Source: Production Yearbook, Food and Agricultural Organisation, 1997.

Since there is hardly any scope for further expansion of area under cultivation, the future production prospects depends largely on the improvements in the yield levels. Here what we need is to break the yield barrier and bridge the gap between the potential and actual yield through research and development (R&D) efforts. ICAR studies reveals that there is vast unexplored technological potential for improvement in the yield of crops. In this context, Swaminathan (1999) noted that the "low yield phenomena" in India should be considered as a "yield reservoir" and it should be treated as an asset for future development of the sector. Exploiting the "yield reservoir", *inter alia*, require substantial investment and development and deployment of high yielding seed varieties. So far the emphasis has been on the use of HYV seeds, but it loses its vigour with time. Therefore, new varieties need to be developed periodically to expand production possibilities. However, agricultural research establishment could not come up with improved varieties of seeds, which are suited to different regions of the country, especially in drought prone areas. Therefore, the country has to build up a vital research system which is responsive to the changing needs and circumstances (Parikh, 1999). Compared to other countries, India's efforts in this direction, in terms of provision of resources, is insufficient. India is investing only around 0.3 per cent of GDP in agriculture for agricultural research, as against 0.7 per cent in the developing countries and 2-3 per cent in case of developed countries (Evenson, *et al*, 1999). Expenditure on agricultural research and education accelerated during the post-green revolution period of the 1970s, but slowed down since the mid-80s and it hovered around 0.49 per cent of agricultural GDP in the early 1990s, which was lower than the requirement of 1.0 per cent projected by the ICAR. Further, the level of research expenditure was sub-optimal or significantly lower than desired in states like Bihar, Orissa, Madhya Pradesh, Uttar Pradesh and West Bengal where productivity is low. Crop-wise, research expenditure was low in case of rice, certain coarse cereals, pulses and oilseeds (Pal, *et al*, 1997).

In India research support for the agricultural sector is provided by i) governmental agencies, ii) international agricultural research centres, iii) imported technology and iv) private Indian research. India is considered as having the largest public agricultural research establishments in the world (Evenson, *et al*, 1999). Indian Council of Agricultural Research (ICAR) and agricultural universities constitute the main part of governmental agencies. However, they suffer from several weaknesses like i) uneven progress of varietal improvement across crops and regions, ii) neglect of crop systems research, iii) unimpressive results of local adaptive research, iv) inadequacy of collaborative multi-disciplinary research, v) weak interaction between researchers, extension workers and farmers; vi) excessive centralisation of planning and monitoring, vii) lack of accountability for performance, etc. (Vaidyanathan, 2000). Studies show that public research and extension have been the major sources of increase in the total factor productivity in Indian agriculture during the post-green revolution period. Estimates indicate a very high return to investment in public research (Rao and Gulati, 1994, and Evenson, *et al*, 1999). Therefore, for achieving greater gains, public investment in research and extension needs to be increased.

Along with public sector, private sector also engages in extensive research and development. It has been reported that expenditures on agricultural research and development in the private sector are approximately half of those expenditures in the public sector. Crop management (mainly in plantations) and processing technology has been the areas on which the private sector research concentrated (Evenson, *et al*, 1999). Along with public sector, private sector needs to be encouraged to take up R and D activities in the frontier areas like biotechnology. However, the associated issues like threat to sustainable agriculture, access and sharing of genetic resources, and the larger issue of importance of agriculture for eradication of poverty by providing nutritional security are to be addressed while encouraging private participation (Sharma, 2000). Two major areas on which R&D efforts needed are i) genetic resource management and biotechnology, and ii) natural resource management and agro-ecology. World over the focus is on biotechnology. On the need for bio-technology, Rao and Gulati (1994) observed that the tool of bio-technology, including genetic engineering and tissue culture offer possibilities for breaking the yield barriers, especially in the unfavourable agro-climatic regions.

In the light of the discussion in this section, we identify the following priority tasks for research and development.

- ◆ ***Greater public investment in R&D.***
- ◆ ***Encourage private sector participation in frontier areas like natural resource management and biotechnology.***

2.8 Development of Non-Farm Sector

Till seventies, the significance of Non-Farm Sector (NFS) in generating employment and income to the rural households did not receive adequate attention in India. This is mainly due to the excessive focus on the growth of formal sectors and relegated the informal sector to the background. In the seventies, however, it was realised that the development of formal sectors could not take care of the increasing rural unemployment and underemployment and development economists and policy makers started looking for solutions inside the rural areas themselves. As a result, development of NFS received the attention of policy makers as an alternative strategy for rural development (Chadha, 1993).

It is being pointed out that the future impetus for development of the rural economy has to come from an expanding rural non-farm activities (Mahajan, 1993). Therefore, NFS need to be developed for creation of employment opportunities and earnings for the rural households, especially the weaker sections. According to the agriculture-led -growth theories, another role of NFS is to stimulate agricultural growth through inter-sectoral linkages. A vibrant modern agricultural sector is based on strong forward and backward linkages with the industry and the NFS (Mellor, 1976). Besides, rural non-farm activities can also play an important role in containing large-scale rural-urban migration (Chadha, 1993).

Recent expansion of the non-farm sector in India is influenced by the rising commercialisation in the rural economy. This is evident from the changing proportion of non-farm employment more and more in favour of wage-paid labourers indicating shift in

production/service activities from the households to non-household ventures. It has been found that landless labourers and sub-marginal cultivating households, which account for 55 per cent of total rural households, are the prominent job seekers in the NFS due to their assetlessness or near assetlessness (Chadha 1993). The proportion of male workers in non-agriculture is more than females in all the states except in Punjab where the participation of females in non-farm activities is much more than that of males (Balasubramanian, et al, 1994). It may be noted that besides the above three broad category of factors, the growth of NFS in India is also contributed by the various government programmes like IRDP, Nehru Rozgar Yojana, etc. for employment generation and poverty alleviation.

Strong backward linkages with the agricultural sector and forward linkages with the modern manufacturing sector are imperative for the growth and prosperity of the non-farm sector. Literature on Indian experience reveals that there exist weak production inter- linkages, the reason being the surplus labour in the economy (Vaidyanathan, 1986). The reasons for the weak production linkages can be found in (a) production of most of the modern inputs except perhaps repair services are in the urban areas and (b) agro-processing units may not be operating in the rural areas, even if they are working they may not provide much employment due to high capital intensity.

Credit is one of the most important inputs required for the activities in the NFS but its availability both for fixed and working capital has been a problem area both in terms of cost and availability. Within the overall scenario of rural credit, credit needs of the NFS received some attention in recent years. Nevertheless, because of the limited reach of the formal financial institutions especially to interior villages and small producers, private channels of credit continue to play an important role in spite of high cost (Eapen, 1996). Therefore, increasing attention needs to be given by bankers to the requirements of the NFS (Vyasulu and Kumar 1994). Experiences of other countries have shown that rural financial institutions are shifting their focus to non-farm activities as they are found to be more viable. SHGs can be a feasible intermediaries to finance non-farm activities.

Given the development of agriculture and allied activities, infrastructure availability, institutional set up and availability of credit, NFS in India has the promise of becoming the most dynamic part of the economy, which can take care of the ill effects of marginalisation process in the sector. To develop this sector on a sustainable basis appropriate policies need to be formulated, institutions needs to be revamped, credit needs to be met and marketing and technological skills upgraded.

From the above discussion, we suggest the following priority tasks for a policy agenda for agriculture to counter the marginalisation process operating in agriculture.

- ◆ ***Development of a sound and enduring non-farm sector for creation of employment in the rural sector.***
- ◆ ***Credit requirements of NFS need to be met by financial institutions. SHGs can be feasible intermediaries to finance non-farm activities.***