Attacking Rural Poverty Through Farm Productivity

CENTRE FOR RURAL STUDIES
LBS National Academy of Administration
Mussoorie - 248179 (Uttarakhand)

DEDICATION

Presented to Shri T.K. Manoj Kumar, IAS, former Deputy Director (Senior) and Co-ordinator cum Vice Chairman, Centre for Rural Studies, LBSNAA Mussoorie, in recognition of his invaluable contributions to the Centre for Rural Studies.

and to

Shri Yatendra Kumar, IAS, Deputy Director, for evincing keen continuing interest in the realization of the mission of the CRS, LBSNAA, Mussoorie.

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FOREWORD

There is a renewed focus on reviving the country's agrarian economy with the announcement of a Rs. 25,000 crore package to assist State Governments. The underlying idea is that current growth rates can be sustained only when the agriculture sector is on track. To maintain the momentum of 8 to 9% growth in economy, we need a minimum growth rate of 4% in the agriculture sector.

2. The Government of India has advised the State Governments to formulate agriculture growth plans for sustained growth. It is expected that State Governments will meet their share up to the base line of the total plan as determined by the Government of India. It is also imperative that State Governments simultaneously evolve a long term plan for up-grading technological inputs in the agricultural sector by focusing more resources and efforts in research and development.

3. Developing countries have stated that the farm support programmes of developed countries keeps their farm prices artificially low. This adversely affects the ability of developing countries to compete at the global level. Developing countries have demanded a level playing field in order to get competitive access to the world agricultural market. There are counter arguments that despite any reduction in trade distortion subsidies, developing countries may still not be able to compete globally because their price transmission mechanism is not able to effectively reassign the change to farmers. Nevertheless, we need to lay more emphasis on increasing productivity in the agriculture sector to make it more competitive and remunerative.

4. The study titled **"Attacking Poverty through Farm Productivity"** by Dr. C. Ashokvardhan, IAS, is a commendable effort in highlighting the importance of the agriculture sector in combating poverty and distress in rural areas.

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PREFACE

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Can we be indifferent to agriculture? We have in India 127 million farmers toiling in the most adverse conditions, fighting the vagaries of the monsoon, an exploitative market and an insensitive bureaucracy. Added to that is an insensitive public to whom it matters little whether their wheat is imported or home-grown and a public opinion, which consistently talks of wasteful farm subsidies, free power and water. So much so that farmers in many states have asserted in recent times that they will pay gladly for their electricity if only it is supplied to them in the first place.

The Draft Approach Paper to the Eleventh Plan makes things a little clearer. This document says clearly, "the National Commission on Farmers has drawn attention to the knowledge deficit which constrains agricultural productivity. To overcome this, the farmer will need..... a good extension system....but unfortunately the extension system has virtually collapsed in most states, partly as a result of constraints on non-plan expenditure..... The result is that farming practices in large parts of the country are sub-optimal. The failure of the organized credit system in extending credit has led to excessive dependence on the informal sources....."

The majority of the 127 million odd farmers in the country produce food crops and some cash crops in rain-fed conditions and they do not have the wherewithal, either by way of credit or, equally importantly, by way of knowledge with which to be able to participate in the commercialization of agriculture.

While the seed replacement rate in agriculture is pegged at 10 per cent as compared to the required rate of 30 per cent, the 20 per cent deficit could be bridged by educating farmers on the benefits of replacing seeds each year. In this respect, the cost of seed is not that important as it comprises a mere 4 per cent of the total cost of production while, on the contrary, a hike in the seed replacement rate to 30 per cent could enhance the agricultural output by 10-12 per cent.

Broadly, soil fatigue due to over-exploitation of soil nutrients reserve and organic matter in high cropping intensity regions, the decline in total factor productivity in most of the agriculturally advanced and intensive regions, improper water management practices, imbalance and sub-optimal use of fertiliser nutrients and distorted ratio of NPK, are some of the factors causing deceleration in productivity. The situation will improve by the strengthening of the transfer of technology measures, enhancement of the seed replacement rates, Integrated Plant Nutrient System and promotion of micro-irrigation. Consolidation of land holdings and crop diversification are some long-term measures. The norms of the Accelerated Irrigation Benefit Programme (ATBP) may have to be relaxed, in order to facilitate the speedy completion of a large number of irrigation projects. Public investment in irrigation has fallen significantly over the successive Plan periods from 23 per cent of the total outlay in the First Plan to 5 per cent in the Tenth Plan. The watershed approach has been accepted as a major theme for the development of the rain fed or dry land areas. The Centre has recently established a National Rain fed Area Authority (NRAA) to coordinate and converge various programmes in the rain fed areas. In view of the looming global energy crisis, the development of bio-fuel species should be encouraged in dry land farming and in wastelands.

The present work entitled **"Attacking Rural Poverty through Farm Productivity"** by Dr. Ashokvardhan is a step in the direction of addressing the key issues of poverty and development. Rural development cannot be viewed in isolation from the issues connected with farm productivity. Rural development, essentially, calls for an assortment of measures aiming at sustainable growth through a composite deal, where farm growth is of central importance. The most formidable challenge is to rejuvenate the agriculture sector through concerted efforts aimed at stepping up investment to improve irrigation facilities, application of appropriate research and technology, product diversifications, market improvisation and rural infrastructure.

It goes without saying that the IAS Officer Trainees at the LBS National Academy of Administration will benefit by going through Dr. Ashokvardhan's presentations and equip themselves to comprehend the tasks ahead that await adept handling when they are part of the managerial team themselves.

PADAMVIR SINGH

INTRODUCTION

T. K. MANOJ KUMAR IAS
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The growth rate in agriculture was less than 2% in the last decade. Yield growth has also declined. Farmers' suicides continue to be an appalling phenomenon is some states. Farming is becoming a non-viable activity. Further scope for increase in the net sown area is limited. Land degradation in the form of depletion of soil fertility, erosion and water-logging has increased. There has been a decline in the surface irrigation expansion rate and a fall in the ground water table. Disparities in productivity across regions and crops have persisted.

The supply and demand side constraints have to be removed to raise growth in the farm sector to the targeted 4 per cent. The support systems have to be tuned to improve productivity and incomes of farmers with emphasis on small and marginal farmers and dry land areas. One of the differences between the green revolution in the 1960s/ 70s and the present 'second green revolution' is that risk is higher in the latter approach as it has to concentrate more on dry land areas.

Agricultural yields can be increased by focusing on yield gap reduction and expanding the area of cultivation. There are substantial yield gaps in all the states between actually achieved at the farm level and the yields that are feasible given the agro-climatic constraints and the existing technologies.

While the unused potential in wheat is only 6% in Punjab, it is as high as 84% in Madhya Pradesh. Similarly, the unused potential in maize is 300% in Assam. In rice, it is over 100% in Assam, Bihar, Chhattisgarh and Uttar Pradesh. These figures show there is considerable scope for increasing productivity with the existing technology to realize the target of 4% growth in the agricultural sector in the 11th Plan period.

Cost reduction in agriculture is important to enable us to compete in the globalize market. Crop sector by itself may not be able to grow at 4% per annum. But horticulture and allied activities like dairying, poultry and fisheries have to grow at the rate of 6 to 7% to ensure 4% growth in agriculture.

The decline in productivity growth is attributed, among other things, to the deterioration in soil quality and water shortages including ground water depletion. Therefore, land and water management should be given the number one priority. Investment in irrigation, watershed development and water conservation by the community are needed under water management.

In order to improve soil quality, the government can restructure the fertilizer subsidies in such a way that it would reduce the consumption of nitrogenous and encourage phosphatic and potassic fertilizers.

As the national commission on farmers mentions, there is a knowledge gap in the existing technology. Hence, extension becomes crucial for improving agricultural productivity. In view of the high variability in agro-climatic conditions, particularly in unfavorable areas, research has to become increasingly location-specific. The most important problem for the farmers is output price fluctuations. There is a big gap between producer prices and consumer prices. There are different models for marketing collectively by the small and marginal farmers. These are the self-help group model, co-operative model, small producer co-operatives and contract farming. There is a need for promoting rural, non-farm sector in the form of food processing and rural services.

Dr. C. Ashokvardhan's work entitled **"Attacking Poverty through Farm Productivity"** takes into its ambit all the critical parameters of farm revival. It is an update on the efforts made at various levels in rejuvenating the farm sector. The author contends that the time is now ripe for a second Green Revolution with an emphasis on diversifying the farm sector further to capture new market opportunities. Agricultural growth in the years ahead will have to largely come from improvements in the productivity of diversified farming systems with regional specialization and

sustainable management of natural resources, especially land and water.

The book is a welcome addition to the shelf of publications by the Centre for Rural Studies, LBS National Academy of Administration, Mussoorie.

T. K. MANOJ KUMAR

ABOUT THE BOOK

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Dr. C. Ashokvardhan's work entitled **"Attacking Rural Poverty through Farm Productivity"** represents a holistic approach to issues connected with farm revival. The work is all set to open new vistas of information to the Academy OTs, who as practising administrators will, sooner or later, have the charge and responsibility for removing road-blocks and bringing about the agricultural breakthrough.

A bare cursory glance at the contents and the text reveals that all the relevant themes that impinge upon farm revival have been meticulously touched upon. The chapter on Kewda Cultivation in Orissa is particularly reflective of case studies in the Ganjam district. Otherwise, too, the approach has been far from being sheer academic and polemic. Grass-root problem areas have been delineated and the current thinking on solutions, with latest data, facts and figures, have been put forth with lucidity and clarity- so very typical of the author.

Agriculture is the mainstay of the Indian economy, as it constitutes the backbone of the rural livelihood security system. It is the core of planned economic development in India, as the trickle-down effect of agriculture is significant in reducing poverty and regional inequality in the country. Growth in agriculture has a maximum cascading impact on other sectors, leading to the spread of benefits over the entire economy and the largest segment of population.

The agriculture sector contributes about 21 percent of India's Gross Domestic Product (GDP), 11 per cent of total exports, and provides employment to around 56.4 per cent of the work force. The rapid growth of agriculture is essential not only for self-reliance but also for meeting the food and nutritional security of the people to bring about equitable distribution of income and wealth in rural areas, and to reduce poverty and improve the quality of life. Of the

agriculture related issues, the Department of Agriculture and Cooperation is dealing with the following items;

- Farmers will be given greater say in the organizations that supply inputs to them.
- The Government of India will bring forward a Constitutional amendment to ensure the democratic, autonomous and professional functioning of the cooperatives.
- Controls that depress the income of farmers will be systematically removed.
- The Government of India will introduce a special programme for dry-land farming in the arid and semi-arid regions of the country.
- The Government will ensure that adequate protection is provided to all farmers from imports, particularly when international prices fall sharply.

The Government will ensure that public investment in rural infrastructure is stepped up in a significant manner at the very earliest. The Government will pay special attention to augmenting and modernizing rural infrastructure consisting of irrigation, cold chain, and marketing outlets.

In pursuance of these thrust areas, the Department of Agriculture and Cooperation has supplemented the ongoing programmes through new schemes in respect of horticulture development in mission mode, micro irrigation, national bamboo mission, reforms in agricultural marketing, etc. In additional, the programmes relating to the (I) National Cotton Mission, (ii) Revival of Plantation Crops Economy, (iii) Institutional reforms in terms of (a) decentralization; (b) simplification; (c) transparency; (d) accountability; (e) e-governance; and (iv) revamping agriculture extension have also been identified for focused attention.

Needless to reiterate, the IAS OTs at the LBSNAA are all set to benefit by this presentation of topical interest and the author is to be complimented for bringing diverse aspects of farm revival in one, handy capsule.

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ACKNOWLEDGEMENT

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I gratefully acknowledge the active assistance received from authorities in the Ministry of Agriculture, Government India, the Planning Commission, the World Bank (New Delhi Office) and the horticulture experts on Kewda industry (Berhampur: Ganjam: Orissa) for giving to the papers included in this volume, the present shape. Technicalities had to be avoided since the presentation had to be palatable enough for the young civil servants, coming from myriad streams and disciplines, into the civil services. The text aims, in the main, at equipping the young officers, with a profile of rural poverty and the role a rejuvenate farm sector can play in lifting the overall economy from the sub optimal to the optimal.

My association with the LBS National Academy of Administration, Mussoorie, dates back to 1980, when I had joined it as a fresh recruit to the Indian Administrative Service. Shri P.S. Appu was much more than a Director of the Academy at that time. A legendary figure on land reforms, a man of high morals and principles, an astute administrator (belonging to the 1950 batch) and a visionary- the 1980 batch felt privileged to have him as Director. Writing 27 years later, since then, I recall the good old days in the Academy and the ex-Director, by way of acknowledging his contributions to the Academy, in general, and to the special effects on training modules, in particular.

One could see the rare combination of the classical and the modern in the current scenario at the Academy. While training and management development aim basically at creating a balanced personality, endowed with a human touch, there are winds of change awakening us to recurring challenges and to stratagems and responses, suited to specific situations. The Academy seems all set to benefit under the stewardship of Shri Rudhra Gangadharan, Director and Shri Padamvir Singh, Joint Director, who, while bringing in a back-up of prolonged administrative experience, are equally

awake to the current demands and pressures on our nerves and resources.

I am happy that my younger colleague Shri T.K. Manoj Kumar, former Deputy Director (Senior) and Co-ordinator cum Vice Chairman, Centre for Rural Studies in the Academy considered my occasional papers useful in the special context of equipping the young and promising civil servants with inputs on some topics of current interest and concern. His overall contributions to the CRS will remain exemplary and unforgettable.

The present incumbent in the CRS, Shri Yatendra Kumar has been, besides being an astute administrator, a visionary. He has the intent and the ability of taking the CRS to the desired heights of excellence in tune with his ideas and plans of action.

But for the spirited and (super) fast computer photo-setting of the text by our Academy colleagues, namely, Shri Samar Singh Kashyap, Shri Adesh Kumar, Shri Dalip S. Bist, Shri S.S. Kharola, Sh. Deepak Kumar, Ms. Anju Bhoyte, Shri Ramesh Kothari and Ms. Anita Gupta, the timely publication of the volume would have remained a mirage.

The last para is reserved for thanking Dr. Saroj Arora, Sr. Research Officer, CRS, who being an ardent research scholar herself, could appreciate the modest researcher within me and who, so kindly could connect me and my work to the mission to which the CRS dedicates itself.

C. ASHOKVARDHAN

CHAPTER- 1
TENURIAL RIGHTS AND LAND MARKETS

Around the world, there are vast differences in the ways people use and possess land and the ecological, economic and social settings in which they do so. Despite this diversity, it is possible to identify some common impulses that have driven land law reforms. First, there have been efforts to install or enhance market economies and reduce the role of the state in economic affairs. The importance of a functioning land market to the health of the overall economy has been asserted. Thus, reform designed in various degrees to strengthen private, marketable rights in land has featured in all regions of the world, especially in countries in transition to market economies. Second, in agricultural societies, access to land is central to the livelihood strategies for the rural poor. Even in societies where there is a shift away from agriculture, access to a small amount of land can play a vital role in supplementing income, meeting subsistence needs and shielding households from economic and nature shocks. Secure rights over land may encourage greater investment and productivity and allow small farmers better to capitalize on the value of land. Third, there are policies in many countries vesting greater responsibilities and powers in local governments and communities. Local people's choices regarding the nature of land rights and institutions that govern them are increasingly being accommodated. Finally, it is being felt that long term property rights are a pre-requisite for the sound use of land. The absence of such rights weakens incentives to use land sustainably and to preserve its value into the future. This logic applies not only to the individually held agricultural land but also to common lands such as pasture or forests, where degradation is linked to the failure to vest management rights and responsibilities in local stakeholders.

The following themes have dominated the reforms of land laws in the last few years-

(i) the strengthening of individual private rights and the partial liberalization of land markets, (ii) the recognition of claims to land and resources by indigenous people and local communities and

attempts to accommodate plural tenure regimes within the national legal framework, and (iii) efforts to facilitate access to land for the poor and to ensure gender equity in this regard.

Diminution in the Role of the State

There has been a steady diminution in the state's powers over privately held lands. There is marked ability of private persons to occupy and use land without unwarranted interference and to deal with their land through sale, mortgage, lease and otherwise. There has been a diminution in the role of the state in decision-making about the use and transfer of land. Virtually every country in the Central and Eastern Europe, from Albania to the Russian Federation, has adopted laws which re-define the nature of the rights and responsibilities of private persons vis-a-vis land, tend to privatize state-held lands and collective farms and seek to set up an institutional and procedural framework for the administration of private land rights and for the operation of markets in land rights. Significant land law reforms have taken place, not only in the Central and Eastern Europe and the former Soviet Union, but also in a number of Asian Socialist or post-Socialist countries, including China, Mongolia, Viet Nam and Cambodia. Paternalistic controls regulating property use have been reduced in Honduras, Mexico, Nicaragua and Peru in South America. The nature of private rights over land have been clarified and the Government interference has been curtailed in a number of African countries such as Mozambique, Niger, South Africa, the United Republic of Tanzania, Uganda and Ghana. While it is difficult to abandon long-standing convictions that land properly belongs to the state, there has equally been a move to focus on greater security, flexibility and marketability of land. Depending on whether state ownership is nominal or symbolic on the one hand, or active or interventionist on the other, private landholders may acquire rights equivalent to full ownership.

While land law reforms are marked by shifts of emphasis, Lithuania's Land Law of 1994 has a liberal tilt. It provides that the land owners shall have the right:

1. to sell, devise, donate, mortgage, exchange or lease the land and to grant others temporary right to occupy and use the land:

2. to occupy and use the land for any business not prohibited by the law and compatible with its defined purpose or use, and to construct any buildings allowed by planning and other legislation:

3. to establish servitudes for others on the land:

4. to make application to change the designated use of the land and to seek changes in any restrictions placed on the land by law.

5. to apply to the courts for protection or compensation against violations of their ownership right:

6. in the course of farming, to make use of water and natural resources found on or under the land (but not to sell them commercially, in accordance with environmental and other laws governing mineral use and

7. to dispose of any produce grown on the land and to use the income without restriction.

China's Land Administration Law (1998) embraces the basic rule of "Collective Ownership" and yet the individual right of the individual components are duly recognized. It provides for 'Peasant Contracts' for 30 years. In Viet Nam agriculture has been de-collectivised by issuing land use certificates, by 1999, to about 10 million households. The land use rights can be inherited, mortgaged, transferred, exchanged or leased. The Parliament of the Russian Federation passed a bill on June 24, 2002 allowing the sale of agricultural land.

Customary and Indigenous Rights

In Latin America, Australia, Cambodia, Canada, the Philippines, the Russian Federation and several other countries, important new laws recognize long-standing land claims by ethnically distinct indigenous groups. In Africa, the debate has revolved around how to strengthen the rights of the people holding land within the customary sector. In Africa, there has been a move to strengthen land rights for the customary landholders entailing, in turn, the

progressive replacement of customary systems with systems of individual private ownership, under titling and registration programmes. Advocates of private, individual title assert that the customary land systems depress agricultural productivity and efficiency. They argue that in the absence of individual, tradeable interests in land, cultivators lack the incentive or the security to make necessary capital improvements or to obtain credit. Under the "replacement paradigm", customary tenures are to be replaced by tenure provided by the State. As opposed to this, the "adaptation paradigm" focuses on creating the appropriate legal and administrative environment to permit evolutionary change within community-based systems. This approach advocates titling activities that are more narrowly focused on particular localities with particular needs, where, for example, conflicts are endemic and customary institutions are failing to cope with them, where land is increasingly subject to competition and where the commercialization of agriculture is relatively advanced.

The two paradigms, notwithstanding, there is a move in Africa toward greater accommodation of local diversity and local decision-making. Under the Mozambique Land Law of 1997, while a provision is made for issuing title document, the issuance of a title is not a prerequisite for claiming protection under the law. The right exists; it is not created by state action. The Mozambique law recognizes the local communities as entities capable of holding rights over land, and of obtaining title to land in their name. The customary rules govern the allocation of land. The law provides legal recognition to the local customary rules, without "freezing" those rules in a bid to codify them. There is flexibility for such rules to evolve over time.

The Village Land Act of 1999 of the United Republic of Tanzania tends to protect the customary rights, whether registered or not. Nonetheless, the Act contemplates a process for the adjudication, recording, registering and issuing of titles for the customary rights. On the village land, land allocation is to be governed by the rules drawn up by the community itself.

Under Uganda's Constitution of 1995 and the Land Act of 1998, customary rights over land are recognized. The customary

occupations of land are endowed with secure tenure even in the absence of registration. Certificates of customary ownership, issued by the Land Committees, are considered conclusive evidence of title over the land. If the conditions in the certificate allow, the land covered by the certificate may be sold, leased, mortgaged or otherwise disposed of. There is also a mechanism for the conversion of customary ownership into freehold. The land may also be held in communal ownership.

The prevailing pattern, in general, in South America, has been one of dispossession, displacement, marginalization and assimilation so far as the indigenous people are concerned. Of late, a multi-cultural approach is being adopted. Rather recent Constitutional and legislative reforms tend to recognize the collective rights of indigenous peoples to own, use and manage their lands. The 1999 Constitution of Venezuela guarantees the indigenous people's right to their lands and habitats as their inalienable, un-leasable, un-mortgageable, untransferable collective property. Equador's 1998 Constitution provides for the recognition of the territorial rights of ethnic groups. The 1996 Agrarian Reforms Law in Bolivia vests in the indigenous communities a collective, inalienable right over land and the resources located thereon. Majority of Latin American laws on land rights have sought to protect identified territories from the incursions of the market.

Nevertheless, there has been a slight trend towards privatization as well. Peru's Land Law of 1995 provides mechanisms for the sale by the state of various types of land within the indigenous territories to the private investors. Similarly, Mexico's Constitution and Agrarian Law of 1992 allow the alienation of "ejido" (communal) land.

The indigenous people had long been subject to dispossession by the government and the outsiders in the Philippines. The 1992 Constitution affirmed the right of the indigenous people to ancestral domains. More than six millions indigenous people gained recognition of their ownership of ancestral lands after the passage of the Indigenous Peoples' Rights Act (IPRA) in 1997.

The debate in this context hinges on protection on the one hand and the ability to adapt to new opportunities and challenges on the other. It remains an open question how to strike a balance. The question is whether an emphasis on protection reflects the needs and aspirations of the local people, particularly in rapidly changing economic environments. There could be stray instances of avenues by which communities or individuals may seek to attract outside investment on their land, subject to an internal process of approval. In some cases, there are opportunities for the individuals or groups to "opt out" of local tenure systems in favour of acquiring individualized titles under a state sponsored scheme (e.g. Uganda's Land Act of 1998). Peru's Land Law of 1995 provides for the sale of certain types of the indigenous lands to private investors by the state. Peru's laws on coastal peasant communities have eased the conditions for the privatization of communal land tenure regimes. The debate on protection us liberalisation, however, remains inconclusive as new initiatives are still untested.

Redistribution of Land

In many parts of the world, the problem of inequitable distribution of land ownership remains acute, exacerbating the problems of landlessness, social tension and unsustainable use of marginal or environmentally sensitive lands. The primary focuses in the post World War II Japan, Korea, Taiwan, Brazil and elsewhere in Latin America has been on redistributive issues. There has been a concerted endeavour to reduce land concentration and transfer land rights to the existing tenants, sharecroppers or labourers on the large estates or to the landless.

There was land privatization in the Central and Eastern Europe and the former Soviet Union. Several privatization mechanisms were legislated across the region, ranging from the auctioning of land owned by the state enterprises to the restructuring of collective farms. The "land share" approach has been followed in the Russian Federation, Ukraine and elsewhere. Under this approach, the members of the collective or state farms have been issued shares representing ownership of a portion of the farm. These shares are transferable through sale or otherwise and may, in theory, be converted into a specific parcel of land for

individual farming purposes. Yet another type of privatization involves the restitution of land to persons or the descendants of persons who owned the land prior to its nationalization under the Communist regimes. If the land has since been altered, the claimant is entitled to choose another available parcel or compensation in the form of vouchers or money. This process has been the centrepiece of Constitutional and legislative reforms in much of the Central and Eastern Europe. In South Africa, restitution was central to the country's post-apartheid land reform programmes. In post- conflict societies such as Cambodia, Burundi and Rwanda, there have been recent legislations, aimed at accommodating the return of large numbers of internally displaced persons or exiles to land that is frequently occupied by new families or Communities.

Redistribution no longer seems to be high on the political agenda of many countries as of now. The measures are, indeed, highly sensitive and there is a lack of political will to go ahead. While the various methods of imposing size limitations on landholdings exist on the statute books, these are seldom invoked. This is happening in Africa, Central and Eastern Europe, the former Soviet Republics and elsewhere. The legal provisions are often easily circumvented.

With the steady diminution in the emphasis on the conventional land reforms measures, we have witnessed "negotiated land reforms" under which the needy buy land from the sellers- the beneficiaries getting financial aid from the State in the process. Variations of this basic approach have been tried in Brazil, Colombia, South Africa and several other countries. The 1994 Land Reform Law in Colombia provides framework for the allocation of land purchase grants. The agrarian managed agrarian reform is basically a model of demand-driven reform with strong involvement by local communities and beneficiaries. The outcome of these measures remains to be seen.

The mainstay of the conventional land reforms was imposing restrictions on tenancy. Leasing was considered an obstacle to land reforms. Restrictions were imposed on leasing with a view to eliminate absentee landlordism and exploitative landlord-tenant relations. Laws in India provided for either the conferment of

ownership rights on the tenants or ensuring security of tenure and fair rent by recording the rights of the sharecroppers in the first instance. The reasons for the resultant eviction of sharecroppers, shifting them from plot to plot to ensure their deprivation of occupancy rights, and lands lying fallow are not far to seek. The landlords apprehended the loss of their lands to the actual tillers, once the latters' rights were recognized. The experience in India shows that far from eliminating leasing and sharecropping, legal restrictions have, in fact, increased insecurity of the tenants and constricted their access to land. Tenancy was pushed underground and remained an informal arrangement leaving the helpless tiller a mere tenant-at-will. Since the state laws put a ban on tenancy, it cannot be expected to come to the rescue and relief of a category of persons it refuses to recognize -officially.

While the landlord-tenant relationship hangs in balance this is to be hoped that the tenancy question in an era of liberalization will be addressed in diverse ways in regions as diverse as South Asia and the Carribean, evoking diverse legislative responses.

Land Rentals and Contract Choice

Land rental markets are generally credited with considerable potential to enhance productivity and equity by facilitating low-cost transfers of land to more productive producers and permitting participation in the non-farm economy. Any potential losses associated with share contracts have been found to be relatively small. Improving on share contracts through government intervention is difficult if not impossible, especially given the considerable flexibility for the contracting parties to adjust to imperfections in other markets. Thus the equity outcomes achieved in land rental markets will still depend on the parties' outside options, and rental contracts are clearly less suitable as collateral for credit market transactions. Rental markets operate in a variety of forms, ranging from highly informal transactions to formalized, long-term contracts. Rentals can have advantages over sales markets.

The rental markets:-

1. allow flexibility in adjusting the land area used with low transaction costs;

2. require only a limited capital outlay, thereby leaving some liquidity available for productive investments rather than locking it all up in land;

3. facilitate easy reallocation of land toward more efficient users than the current owners, especially if the current owners are old, are non-cultivating heirs, are urban beneficiaries of restitutions, and so on;

4. provide a stepping stone toward land ownership by the landless; and

5. help overcome, through sharecropping contracts, market failures in labour, insurance, credit, management, and supervision, thereby potentially helping secure the competitiveness of participants.

If the distribution of the surplus between the landlord and the tenant is not too skewed, rentals will have a positive impact on equity. Land rental markets serve an important function in equalizing returns to non-tradeable factors of production, such as family labour and bullocks in India. Rental markets transfer land to more productive producers, thereby increasing overall output in the economy. If there are labour market imperfections or unobserved differences in ability across producers, well functioning land rental markets can help transfer land to its best use at comparatively low transaction costs. This can improve production efficiency, and also will often enhance the distribution of income and reduce the vulnerability of the poor households by offering a more stable source of livelihood than they would have by selling their labour in frequently volatile and imperfect local labour markets.

The wage workers' true effort is not easily observable in the rural labour markets. Such imperfections imply that the wage workers will have limited incentives to exert effort and either need to be supervised at a cost or be offered contracts that provide higher incentives such as piece rate contracts. In agricultural production, spatial dispersion of the production process and the vagaries of nature imply a need to constantly adjust to micro-variations of the

natural environment. Family members have higher incentives to provide effort than hired labour. They share in output risk and can be employed without incurring hiring or search costs. Even though owner-operated family farms may hire or exchange labour for seasonal tasks, they avoid the need to supervise permanent wage workers, implying that they enjoy a productivity advantage compared with large farms with numerous hired labourers. These attributes underlie the general superiority of family farming over large-scale wage operations. The imperfections in the rural labour markets point to the dichotomy in labour costs in the diverse context of land-scarce households and land-abundant households. The land-scarce households that have to sell their labour in the market will face some transaction costs, which will imply underemployment and a marginal value of labour-time below the market wage. On the other hand, the land-abundant households that, in a world without transaction costs and imperfect supervision capacity, would contract labour to cultivate their land, will have a marginal cost of land well above the market wage. Assuming that other factors such as ability, access to capital, and technology were equal between the land-scarce and land-abundant households, the ability to attain additional land would improve the livelihood of the land-scarce, labour-abundant households by allowing them to employ their underutilized labour more effectively and increasing their shadow wage.

A fixed rent contract, as opposed to a share contract, will provide optimum incentives for effort supply to the tenant, but because the tenant has to pay rent even in case of total loss of harvest, for instance, because of flooding or drought, it may be too risky for the tenant. Nonetheless, any type of contract other than fixed rent would result in an undersupply of effort by the tenant or the worker, which would lower the total production. This would imply, that the optimal course would be to offer fixed rent contracts (or a higher share of output) to tenants who have higher skills or for tasks and crops that are more skill intensive. In India, more experienced individuals receive tenancy on fixed term contracts and the less experienced ones receive wage contracts.

The continuum of contractual options extends from pure wage labour over sharecropping to a fixed rent contract. Any rental or wage labour contract can be viewed as consisting of a fixed

payment between the two parties together with a sharing rule that defines how output will be divided between the tenant and the landowner. By affecting the incentives of the parties, the surplus to be kept by them, and the risk each of them has to bear, these two parameters will affect the efficiency and the equity outcome associated with any contract in predictable ways. They do so through their impact on the incentives for effort supply as well as on the risk that each of the contracting parties has to bear. The final impact of these on production, and thus the chosen contract, will depend on the technology and the importance of long-term investment for soil fertility and other productivity- enhancing measures.

In the Philippines, even in designing short-term contracts, landlords make adjustment to account for the need to maintain land quality in the long term. In a multiperiod context, where tenants and landlords can develop reputation, the likelihood of a more efficient contractual arrangement is increased. Empirical evidence from Sicily demonstrates that the landlords employed long-term contracts for crops that had higher maintenance needs.

Tenants may be able to meet only part of their working capital requirements in the credit market because of the limited suitability of unharvested crops as collateral and at higher interest rates than the landlord would get by offering the land as collateral. The Tunisian experience suggests that the differences in the contracting parties' working capital endowments can account for the coexistence of a variety of contracts, even in the same environment and among parties with similar risk aversion characteristics. Working capital appears to be a significant explanation of the type of contract chosen and the production gains achieved on a given plot. While the landlords prefer tenants who already possess some land and draft animals, such tenants are able, in turn, to obtain better contract terms.

Land Sales Markets

In situations where investment is important, tenancy may be less desirable than the sale of land, because a number of reasons could prevent landlords from reaping the full benefits of land-related investments. Land sales markets pertain to lands earmarked for

permanent use. With investment initiatives higher than the short-term rental making land itself marketable provides a basis for using it as collateral in credit markets. The whole process is conducive to the development of formal financial markets and producer's access to formal credit. Whereas the rental market contracts can be adjusted to overcome the impact of capital market imperfections, the land sales markets will be affected by credit market imperfections. Any returns to land, such as subsidies, will be capitalized in land prices. A number of factors could increase the price of land above the present value of profits from agriculture. Land may be an important store of wealth and may be acquired for speculative purposes. In such situations the poor but efficient producers may find it extremely difficult to gain access to land through the sales-purchase market. Speculative purchases, distress sales and artificially inflated land values reduce access to land by low-income and landless buyers. Since returns from agricultural production are highly covariate, demand and therefore, land prices, will be high in good crop years when savings are high, sellers are few and potential buyers of land are many. Conversely, the need to satisfy the basic subsistence constraints could give rise to a large supply of people who are forced to enlarge in distress sales of their land in bad years, often to individuals with incomes or assets from outside the local rural economy. Hence, in areas with poorly developed insurance and capital markets land sales will be limited mainly to distress sales. Studies in India and Bangladesh confirm this hypothesis. Both the limited availability of credit and the high cost of borrowing would prevent those who do not have accumulated savings from acquiring land. Speculative land price bubbles that increase the price of land over and above the net present value of the flow of services that can be derived from it are often fueled by excessive credit. With populations growing and urban demand for land increasing, people expect the price of land to appreciate, and some of this expected real appreciation is capitalized into the current land price. Where any of these factors drives land prices above the capitalized value of the income streams associated with such land, the poor have difficulty buying land. Even if they are provided with credit on market terms, the difficulty in buying land persists unless their productivity advantage from lower labour costs is extremely large.

High transaction costs can result in segmented markets. Transaction costs related to land can take many forms and normally include notary fees, registration fees, and survey costs, as well as any transfer fees. For example, in Russia, even though fees for notaries and registration are not excessive, fees for private surveying are equivalent to two years' of the minimum wage reducing the ability of the less wealthy to participate. In some countries, there is a requirement to have any land sale approved by high political authorities. This can lead to segmentation and assymetry of land sales markets. In such situations land sales across the farm size classes are virtually absent, but a considerable amount of land transactions occurs with the farm size groups, that is large or small farmers.

In a nutshell, all the above-mentioned factors will make land acquisition more difficult for the poor households. Hence, the redistributive potential of land sales markets is often limited.

Empirical Evidence of Land Markets

One of the advantages of rental rather than sales transactions in several industrial economies is that in a dynamic economic environment, with the possibility of using other assets as collateral, many participants see lesser advantages in tying up large sums of capital in a land purchase and prefer to invest in other farm-specific assets. 71 percent of farm-land is rented in Belgium, 48 percent in the Netherlands, and 47 percent in France. The share of land rented in the United States increased from 35 percent in 1950 to 43 percent in 1992, much of which involves sharecropping. This illustrates the flexibility of land rental in an environment where security of property rights is high and long-term contracts can be enforced. To increase the tenants' incentives for making investments with long gestation periods, developing a regulatory and institutional environment where long-term leases can be enforced is important to ensure that the rental markets can lead to optimum outcomes. Indeed, many industrial countries regulate rental markets and assist parties in various ways to reduce transaction costs and contribute to broader rural development. The French Society for Land Management and Rural Establishment provides access to information and legal assistance in relation to transfers of farms, both for owners

and renters and across generations to facilitate land access by the young through rentals and sales.

In the countries of Eastern Europe where land was restituted to the former owners, short-term rental contracts came handy as an adjustment mechanism as long as formal property rights still had to be sorted out. It provided the households that lacked either the ability or willingness to farm their lands themselves with an opportunity to receive a stable return. In Moldova, for example, the emphasis on leases enhanced the ability of the land market to develop rapidly compared with, say, Estonia, which had discouraged the use of leases. More than 80% of the 440,000 registered private farms in Moldova operate through some type of leasing arrangement. The share of producers who lease land in the Eastern European countries ranges from 2 percent in Albania with its egalitarian land distribution, between 7 and 8 percent in Bulgaria, Hungary and Romania and about 40 percent in the Czech and Slovak Republics. In general, rental markets contribute to the intergenerational mobility of land, that is, shift it to younger producers, in addition to transferring land to smaller producers and to those with less land but higher capital endowments.

Even though lease markets in the Central and Eastern Europe and in Russia are active on paper, only a small share of households (about 7 percent) have taken their land out of former collectives to start individual farming. The privileged access to machinery, capital, and output and input markets, together with political connections, greatly increase the bargaining power of the former collectives. In a transition, where risk is high, access to input and output markets is imperfect and information on legal options is limited, politically and economically powerful former managers of collective farm enterprises have often been able to induce the new owners to re-invest their land shares in a reformulated collective. In case, the collective goes bankrupt, ownership shares will pass into the hands of the creditors ending up in the re-creation of a highly concentrated land ownership structure with all the negative fall-out on equity and efficiency. In Russia already some large conglomerates have acquired millions of hectares of land for speculative mining purposes. To prevent such speculative acquisition at prices that are well beyond the actual value of the land, it will be

important to landowners to learn about their rights and educate them about the value of land in the longer term. Access to land will be constricted so long as such information is not disseminated. The landowners have to be systematically informed about their options in relation to land use. It has to be ensured that lease terms are more transparent. Disseminating information, providing model lease contracts, and registering longer-term leases will reduce transaction costs and, by increasing transparency and ensuring that outcomes are likely to be beneficial.

In the Central and East European countries, where lands are fragmented, assembling viable holdings entails negotiating with a large number of landholders who may be opportunists holding out threats to withdraw. In such areas, longer-term contracts are needed to ensure investments in complementary capital.

Rental markets are fairly active in Africa. Rental markets have a long tradition in West Africa. Complex mechanisms to transfer land and tree rights for varying periods have been common since the 19th century and one linked to recipients making long-term investments, as in the humid areas of Benin, Cameroon, Coste d' Ivoire, Ghana, Nigeria and Sierra Leone. The case of Ghana illustrates the flexibility of contractual arrangements and their adjustment to changed factor scarcities. Ghana's cocoa sector can illustrate how markets and the contracts used in them evolve dynamically in response to increasing land scarcity. In the early 19th Century a share contract emerged as a way to attract migrants who were interested in establishing plantations, but did not have enough capital to buy land. Migrants received land on which they established a cocoa farm and gave one-third of the developed area or one-third of the yield back to the original owners of the land. By the 1960s more than 95 percent of the land was cultivated by the migrants who had acquired land in this way. However, with increasing land scarcity, the practice became less common, the terms of the contract shifted in favour of the landowners to a 50 percent share contract and the increasing formalization of contracts ensued. Agro-industry has also developed similarly structured outgrower arrangements with the share tenants. This suggests that in addition to more rapid non-farm development to help alleviate the land constraint, clarifying and

formalizing contracts could have benefits in terms of land productivity and conflict avoidance and resolution.

In a large part of Eastern Africa, both land sales and rentals appear to be active. Evidence from Uganda also suggests that activity in the rental markets has increased sharply with economic liberalisation and the associated growth of opportunities in the non-farm economy. The share of households renting land increased from 13 percent in 1992 to 36 percent in 1999.

It has come out empirically that land rental helps to improve efficiency and transfers land to those with low land endowments. In Western Ghana, tenancy transactions have equalized the operational land distribution. Such temporary land transfers have a positive impact on equity, being generally pro-poor and beneficial for women. In Uganda, by transferring land to more productive producers, rental markets facilitate greater allocative efficiency in the rural areas.

Market prices, however, have not been compared, with capitalized values from agricultural production or with the productivity of land use. But it definitely implies that land carries some premium as a store of wealth.

Land rental markets have started to emerge in Asian countries that have recently liberalized land tenure arrangements, such as China and Viet Nam. In China, the share of households participating in land rental arrangements increased significantly from 2.3 percent in 1995 to 9.4 percent in 2000. A similar increase in the incidence of land rentals over time is apparent in Viet Nam in an environment that started from a highly egalitarian allocation of land. In 1992, only 3.8 percent of the rural households participated in land rental, compared with 15.8 percent in 1998. Both China and Viet Nam are increasingly restricting the scope of administrative reallocation and loosening restrictions on land rental as the nonfarm economy develops. In a number of Asian countries, such as Cambodia, China and the Lao People's Democratic Republic, the state or the collective still owns the land, and the insecurity of rights often implies that formal sales markets do not exist. In Sumatra, land sales transactions contribute to greater inequality of

landholdings, whereas the rentals help equalize the operational holdings.

A legacy of rental market restrictions has affected the market activity in South America. The impact of rental restrictions has been significant. For example, in Colombia the amount of formally rented land decreased from 2.3 million hectare to 1.1 million hectare in 1988 following the imposition of rent ceiling legislation. Much the same occurred in Brazil. Land rental restrictions also led to widespread tenant evictions in many Latin American countries. While in many cases the restrictions have been repealed, participation in the rental markets continues to remain limited. This implies that restoring confidence in the property rights system takes time. The main factors limiting the land rental transactions are weak property rights and the lack of reliable conflict resolution mechanisms. The ensuing insecurity implies that the landowners are reluctant to rent out for fear that the tenants will establish a claim to the land. Hence, rentals are few, informal, short term, and often limited to closely related people to facilitate enforcement. The effect of land market liberalization has only been marginal. The fact remains that government-sponsored land reforms efforts in bringing land to productive and poor producers, may benefit from making greater use of land rental markets.

The recent macroeconomic liberalization and the associated elimination of special privileges for large producers have helped to lower the land prices considerably. Incentives for speculative land acquisition have been reduced. Prices have been brought more in line with profits from agricultural cultivation. In Brazil, the land prices dropped by up to 70 percent in the early 1990s, making it easier to acquire land for productive purposes. This was true also to Colombia, where the overall level of the land purchase prices is now more in line with productive returns. Nonetheless, the demand for land sales transactions could not increase. Low international commodity prices implied a need for those acquiring such land to make additional investments to allow a shift to other crops. But the same was prevented by the lack of the necessary marketing infrastructure and technology or the absence of rural credit on account of high transaction costs associated with the same. Land sales markets in Latin America are relatively active, with average

annual turnovers of 5 per cent in Colombia, 2 to 3.5 percent in Venezuala, 1.4 to 2 percent in Ecquador and 1 percent in Honduras. However, in situations where activity is high, markets are often found to be highly segmented implying that sales involve either from large to large or from small to small producers but rarely across different farm size groups.

Agricultural Leasing Arrangements

Beyond landownership structures and customs, a significant factor in determining the types of leasing arrangement has been the relative development of markets, reflected primarily in the strength and direction of the power relationship between the landowner and the tenant. In regions where the markets (particularly in land and products) function relatively well, such as in Europe, tenants have gained a degree of independence that has been recognized and protected in law. Elsewhere, especially in parts of Asia, tenants have remained largely dependent upon their landowners, leaving them in a weak position to protect their rights. One of the primary results of this is that most European states have a highly formalized lease structure framed within a well-developed and enforceable rule of law with built-in safeguards for both the tenants and the landowners. In contrast, many countries in Latin America, Asia and the Near East have regulations controlling leases but often lack institutional structures strong enough to enforce these regulations.

The most significant positions in the range of tenancies are as follows:

1. Contractual license arrangements, in which the landowner determines and largely undertakes all farming decision-making and operations, but licenses others to perform certain functions, often involving crop planting and harvesting:

The system of Tebasan, as practised in Indonesia, is based on an agricultural merchant agreeing a license with a farmer to harvest a standing crop. This is done to ensure that the merchant is able to control the harvest activities, thus effectively avoiding both the work and the risk of growing the crop, as well as being able to determine its quality prior to purchase. Consideration for the crop

(including the license) is usually part-paid in advance. The extent of this prepayment will depend upon the degree to which the farmers and the merchant agree on the valuation, together with any discount the farmer is prepared to take in order to receive income prior to the harvest. The remainder is paid in instalments, post harvest. By using this system, a farmer gains access to post-harvest storage, as well as to informal credit.

2. Labour tenancies, in which labourers receive a token wage or share of output, together with usufruct rights to a small parcel of land for their own purposes (usually subsistence):

The labour tenancy is found in the rural areas of many countries in Africa and Asia. The land-poor labourer receives usufruct rights to a small parcel of land (and sometimes a dwelling). The labourer often has relative freedom to use the land either for subsistence (its original purpose), or to produce a cash crop for sale. However, it is equally recognized that such forms of tenancy often amount to little more than 'bonded labour;' with workers quite unable to earn enough from the small parcels to free themselves from what is often an exploitative relationship.

3. Sharecropping and other similar arrangements, in which the expectation is that the landowner and the tenants share the cost of inputs and receive a share of outputs. This may vary from arrangements which look very similar to contractual labour relationships, to those where the scale of the venture more closely resembles a full tenancy.

An example of classic sharecropping is the introduction of yanaconaje for cotton production and other commercial crops on the coast of Peru after the abolition of slavery and of the Chinese indentured workers. Initially, sharecropping was convenient for the landowners because little capital outlay was needed; risks were borne mostly by the sharecroppers, while the share-cropper's family provided additional labour, particularly during the peak harvesting time. In these sharecropping arrangements, the landowners provided land, seed, oxen and tools in exchange for a percentage of the harvest. They also offered loans at high rates of interest. Sharecroppers were obliged to sell their share of the cotton harvest

to the landowner at below market price. This imbalance led to the agrarian reforms of 1962 and 1969, which gave the yanaconas the opportunity to buy the land that they had been sharecropping.

In a nutshell, sharecropping is an agreement to produce agricultural products. Where the landowner provides the land (and sometimes other inputs) and the sharecropper provides the labour (and occasionally inputs such as seeds). At the end of the agricultural cycle the harvest is divided between the parties on a pre-agreed basis. These types of arrangements allow both the land-poor and the cash-poor (whether landowner or not) to farm. Although some agreements may be more complex, in having additional responsibilities, all follow this basic pattern.

Beyond the conventional sharecropping agreement, there are also many cases in Latin America and Africa of 'equal input share' agreements. These cases are characterised by the parties contributing more or less equal shares (often both consisting of some land and other capital), and gaining more or less equal shares of the outputs. There are often intra-family arrangements that effectively combine a number of small holdings under one management.

Although not common in many parts of the world, "partnership farming" has become established in Europe, as a means of combining a range of skills and access to resources in one business. Rather than the usual separation of interests of the landowner and sharecropper, a partnership implies a common business, in which the partners (usually the landowner and the tenant) work together for their common interest. As a result, resources are effectively pooled within the partnership and all produce is marketed as a single entity. Inputs to the partnership may be unequal (usually land and expertise), as can be incomes. While partnerships allow the farming partner greater certainty than under sharecropping, and allow the landowner to be less involved in the day-to-day management of the business, the debts of one party are generally the liability of the other party. In addition to a formal contract, partnerships, therefore, demand both trust and, ideally, longer-term continuity in order to prosper.

4. Fixed rent tenancies, which can be either short or long term, and can be subject to fixed or variable term lengths.

Fixed rental agreements are used when landowners are absent from their estates, and require an income stream to be generated in their absence. Such tenancies are generally restricted to tenants of some socio-economic standing (and with access to capital) rather than being generally available to all resource-poor farmers. In the more developed agricultural markets of Europe and North America, the fixed rent tenancy is a standard vehicle for delegating the management of a farm from its owner to a commercial tenant farmer. Although the actual length of the lease term can vary, the level of capital investment is such that many tenants remain in occupation for a number of years, adopting farming and management practices indistinguishable from owner-farmers.

5. Reverse agreement, in which owners of small holdings lease out their land to longer scale farming operations while also taking up paid employment, either on their own land, or elsewhere:

Mexican ejidatarios are small holder families that have secure usufruct rights to land adjudicated to the ejido community under the land reform legislation. Typically, they have no capital and little access to credit. Agri-business ventures are able to consolidate many ejido plots into one medium-sized parcel. Often, the ejidatarios work as wage labourers on the land they have rented out. Equally, a form of reverse sharecropping is practised in parts of Central Europe, with those gaining land under restitution choosing to allow the local co-operative to manage it, in return for employing them and providing them with a share of the produce from their land.

At the core of effective leasing arrangements is an underlying assumption about the tripartite relationship between the landowners, the tenants and the state. This relationship is essentially one of mutual responsibility, in which each party has certain duties to perform. The most fundamental of these duties fall on the state, in creating an appropriate framework within which the landowner and the tenant can operate. Despite the variations in tenancies, there is much commonality at the scale of the individual agreement.

At the core of most of the arrangements are the issues of risk, security and trust. Even under the most highly regulated systems, the landowner/tenant relationship is still dependent upon the level of trust that can be established between the parties. Where there is trust, the tenant in particular, will gain more freedom and incentive to operate, regardless of the nature of the actual lease arrangement. A better balance of power allows both the parties to achieve objectives which are acceptable (if not ideal) to them. Within this framework, the principal issues to be addressed by both the landowners and the tenants are:

(a) the length of the lease term, together with the security provided by the tenancy;

(b) the degree of freedom and control afforded to each of the parties; and

(c) the flexibility and financial implications of this combination of term, security, freedom and control.

The two fundamental issues relating to all tenancy arrangements are security for the tenant and flexibility for the landowner. When leases become highly regulated and protected, they are generally unpopular with the landowners, who perceive that their power and flexibility is being circumscribed by the state. When informal or under-regulated, however, tenancies are seen to deny the security desired by the tenants.

The following essential provisions should be addressed in all license agreements:

1. Names of the parties;
2. Agreement to share the land;
3. Commencement, duration and method of termination;
4. Share of inputs;
5. Share of outputs;
6. Dispute resolution.

The main factor inhibiting the development of leasing arrangements in all parts of the world is a lack of appropriate information on current lease practices and trends. The development of a simple recording system for rents, fees and input/output shares, for example, can put tenants into a much stronger position in negotiating a lease. Similarly, such a system will also inform the landowners whether or not they are gaining appropriate returns from their land. Given the range of variables that can affect rents and other payments, such systems are usually best collated at the local level, and would be combined with the function of registering lease agreement documentation. More sophisticated systems could also include lists of common lease obligations, reference to commodity price and to other sources of useful information, such as the cost and availability of credit.

Issues and Possibilities

1. Some commentators argue that measures designed to improve the marketability of land may, in effect, undermine the ability of the poor to acquire and retain land. Others argue that there is an inevitable tension between a market-oriented approach and the recognition of customary rights or community interests in land. The experience so far has been inconclusive and at times contradictory.

2. In many laws from the Central and Eastern Europe and the former Soviet Republics, it is common to find:

- full prohibitions or moratoria on the sale of agricultural land;
- artificially high "floors" imposed on the sale price of land;
- restrictions on the capacity of business entities or foreign nationals to acquire agricultural land;
- stipulations as to the qualifications of persons who can acquire farm land;
- unclear or non-existent rules concerning mortgaging and leasing of private lands;

- affirmative obligations to use land in a certain way, with the possibility that land may be forfeited to the state if not used productively or if environmental or land use laws are violated; and

- the retention of broad powers on the part of the state to rescind land allocations.

The selling of agricultural land may provoke fears that inexperienced small holders will be victimized by the speculators, that food security will be undermined by agricultural land falling into the hands of the non-cultivators, that the fabric of rural society will be destroyed and that migration to the cities will accelerate.

3. In one form or another, concerns over the potential social effects of land markets have played a role in the design of land law in all parts of the world throughout history, and will continue to influence efforts for the foreseeable future.

4. Titling might itself contribute to insecurity of tenure in the indigenous domain, by raising the spectre of land being lost to outsiders and creditors, and by disrupting locally recognized systems without replacing them with other institutions that can or will effectively protect the newly delineated rights. Typically, the main sense of insecurity experienced within strong customary systems is caused by the behaviour of the state and external market forces. The legal status of customary areas is so poorly or weakly defined by the state law that some governments have tended to treat such areas as reserves of "empty" land, open to discretionary allocation and re-allocation.

5. Tenure security is a critical precondition for the rental markets to function. Where land tenure is not secure, the landlords who rent out will run the risk of not being able to claim their land back, implying that tenure security is especially crucial for the emergence of long-term contracts. Evidence from Western Europe and other industrial countries suggests that with secure long-term rights and long-term rental contracts, many entrepreneurs with limited capital endowments may actually prefer to rent than to buy land.

6. Unless secure long-term contracts are available, the incentive for either tenants (who may be the only ones with the labour and information available to do so) or for the landlords (who may have the needed capital) to make investments in land may be severely limited. The ability to adjust for this type of market failure without long-term contracts can be adjusted to avoid dis-incentives to land-related investment.

7. Because of a view that tenancy is an exploitative relationship, governments in many countries tried to either limit sharecropping or regulate rental in a way that would improve the welfare of tenants. Implementing tenant protection and rent ceilings effectively is not easy and that where implementation is incomplete, they can easily reduce land access and thus equity, contrary to the professed goals. For example, estimates indicate that the introduction of tenancy legislations in India was associated with the eviction of more than 100 million tenants which caused the rural poor to loose access to about 30 percent of the total operated area. Furthermore, by threatening landowners who lease out with the loss of their land, the legislations have driven tenancy underground, thereby reducing the opportunity for greater land access through rental markets and greatly reducing the informal tenants' bargaining position and their ability to enforce contract terms. Indeed, of all the Indian states, only West Bengal, after a communist victory in state elections in 1973, mounted an effective campaign for tenant registration. Analysis suggests that the impact of doing so was positive and agricultural productivity increased. Tenants' ability to subsequently acquire limited amounts of lands through the regular sales markets also increased slightly.

While rent controls can transfer some resources to the tenants, they tend to make everybody worse off by restricting the supply of land available to the rental market, undermining tenure security and reducing investment. Rent ceilings will invariably reduce the landlords' investment incentives and possibly their willingness to rent out, implying losses in productivity. Legal or other restrictions on the functioning of the rental markets that continue to be in place in many countries, for example in China, Ethiopia, and India, will have a negative impact on agricultural development and the

households' welfare, will discourage investment, off-farm employment, and migration, and will increase the insecurity of land rights.

Although there are many instances where tenancy continues to be widely practised, despite its legal prohibition, the de-facto illegal nature of the tenancy relationship might provide the landlords with additional leverage that they can use to bargain down the rewards to the tenants. Even in India, considerable discussion is now under way about eliminating rent ceilings to facilitate greater access to land by the poor. More in-depth studies of the possibility of small farmers renting out to the large landlords ("reverse tenancy") and its implications are required.

8. Steps to reduce the transaction costs associated with the land transfers, for example, through better land records or standard contract formats (which the individual parties may or may not adopt) and default regulation of tenancies, may improve the level of activity in land rental markets.

9. Land sales markets are likely to be much less active than the land rental markets all over the world because of higher transaction costs, difficulties in accessing long-term capital to finance land purchases and insecurity about future economic developments that would significantly affect the land prices. On the supply side, with limited insurance markets, exogenous shocks can lead to distress sales of land. On the demand side, distortions in product markets, together with imperfections in the credit and financial markets will affect the functioning of the land sales markets. There have been government interventions in the land sales markets as well. One is the imposition of high land ownership ceilings. The other is authorising the local communities to restrict the transferability of land as is the case in most customary systems. Since transparent mechanisms are unlikely to prevail, the preferred policy should be to forgo restrictions. It can only be hoped that with the changing economic circumstances, restrictions will be relaxed.

10. Restrictions on land market activity with regard to government land granted to beneficiaries, have limited investment. The governments generally prevent the beneficiaries from selling or

mortgaging the grant lands. Even temporary restrictions on land mortgages can be counterproductive. The beneficiaries are deprived of access to credit at an establishment stage when they need it the most. Investment was limited in the Philippines and Korea due to restrictions on land markets. Land received under land reform in Chile was freely transferable and this was the key of its success. Precluding the land reform beneficiaries from sales in the medium term would reduce efficiency by preventing adjustments in response to differential beneficiary abilities, and could, if combined with rental restrictions cause large tracts of land to be underutilized.

11. Moratorium on land sales may be justified as a way of allowing new landowners to acquire better knowledge of their assets and prevent quick sell-offs at unrealistic prices. After decades of collectivism, the new landowners' exposure to the land sale markets may cause them to dispose off their assets without being aware of their true value, leading to a concentration of land in the hands of speculators.

In Albania, this restriction has been combined with a right of first refusal, whereby before consummating a land sale to an outsider, neighbours or village members must be given the opportunity to acquire the land at the same price for some period. This allays the community's fears of land being bought out by outsiders.

Bolivia has a minimum holding size that cannot be mortgaged or alienated. While these regulations impose some losses in terms of foregone credit market access, they can also help to reduce undesirable social externalities from driving some people in destitution.

12. Ownership ceilings have had only a marginal impact on land distribution. The main reasons for such failure were political, including an inability or unwillingness to act quickly, which facilitated spurious subdivision of holdings on paper by the landlords, and exemptions for high-value crops, which gives latitude for arbitrariness and corruption. Since the imposition of ceiling laws in most Asian countries, population growth and subdivision of land

through bequest have further reduced the ability to use land ceilings as a means of making land available to the market.

Application of ownership ceilings to plantation crops has been linked to reduced investment and employment generation by the landowners who were above the ceiling, as well as by the new investors, who were able to get access to the land they required only through long-term lease from a large number of small-holders.

13. The costs of fragmentation are relatively modest in unmechanized, semi- subsistence agriculture; where rental markets can often be relied on to bring about a structure of operational holdings that is more in line with economic needs. Households prefer to be able to rent out land on an individual basis and in doing so, also seem to be able to capture most of the effects that were hoped for from a more centralized form of consolidation. Studies from China, which show that consolidation could lead to output gains of up to 15 percent, also recommend relying on voluntary and decentralized market processes rather than on administrative solutions.

The disadvantages of fragmentation increase with the level of mechanization. With the emergence of a dynamic non-farm economy, mechanized farming becomes desirable and the losses from fragmentation may assume grater relevance. In industrial countries, fragmentation becomes a serious constraint requiring intervention once it impedes the ability to use machinery on a large scale. Returns of upto 40 percent for consolidation have been found in France. Conversely, benefits from consolidation are considered to be small in Pakistan.

Farmers may seek some fragmentation of plots to diversify crop locations and manage risks, overcome seasonal labour bottlenecks, and match soil types with crops to overcome inefficiencies in land, labour, credit, and food markets. To decide whether concern about such fragmentation is warranted, an understanding of the causes underlying this phenomenon, the magnitude of the losses it may impose, and the availability of policy options that could deal with the problem at a reasonable cost is necessary.

Finally, land markets cannot be viewed in isolation form the broader social, institutional, and economic framework. Imperfections in other markets will have differential impacts on specific types of households and will affect land market outcomes. A differentiated approach to the land market policy taking into account the environmental impacts, internal capabilities and constraints of a given land market and the limitations of government interventions will be appropriate. Then again, relying on markets alone, may not be sufficient. The acquisition of managerial experience by potential beneficiaries is no less vital to the success of land markets. Apart from structural adjustments in fluid situations, the impact of rental markets on equity depends largely on the alternative opportunities open to the tenant and his understanding and utilisation of the same. Complacency and dependency syndromes will keep the best of institutional arrangements at low ebb.

Select Reading List

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CHAPTER 2

THE CHALLENGE OF RURAL POVERTY A CASE FOR FRESH INTERVENTIONS

Poverty has been commonly defined as an unacceptable deprivation in well-being. Its measurement is rather difficult as the notion of "well-being" itself has economic and non-economic dimensions. Access to free government service with respect to one family and the absence of such an access for another, will have differentiated outcomes vis-à-vis impoverishment, despite both the families having similar income levels. Imperfections in markets, coupled with differential or discriminated behaviour, social or cultural, may lead to lop-sided economic growth. Hence, income and consumption based measures to grasp the magnitude of the problem may not be adequate. Steady diminution in human capabilities, dilapidated skills base, meagre or no access to education, undernourishment and depleted health, too, count for the myriad facets of poverty, besides low incomes/ consumption levels.

The Impact of Economic Reforms on Poverty

The 1990s saw a major reorientation of economic policy, away from the control-oriented economic system with a dominant role for the public sector, and a gradual opening of the economy to world trade and foreign investment. The reforms of 1991 were initiated in the backdrop of a severe balance of payments crisis which began in late 1990s and reached critical proportions by mid-1991. In the aftermath of the reforms, the payments crisis was overcome within two years and there was also no relapse in any of the years since then. On the growth front as well, the performance was commendable. There was an acceleration in economic growth in the five years following the crisis compared to the five years preceding it, and the average GDP growth in the three years 1993-94 to 1996-97 actually exceeded 7 per cent per annum.

The key litmus test for the economic reforms, nonetheless, was their impact on poverty. Various sample surveys after 1991 appeared to show that despite the high rate of growth of GDP recorded in the national accounts, the percentage of population

below the poverty line seemed to be unchanged. Critics argued that the economic reforms had promoted a type of growth that was distributionally malign, with benefits accruing only to the better off sections of the population, while the poorer groups experienced little, if any, progress. The debate on poverty measurement hinges principally on the estimates made by the NSS (National Sample Surveys) under the aegis of the Planning Commission as well as the studies made by the periodic Market Information Surveys of Households (MISH) conducted by the NCAER (National Council of Applied Economic Research). Probably, we need better survey data and improvements in the methodology must be continuously attempted, though, efforts to improve the system could create problems of comparability. Parallel with improvements in survey data there must be an attempt to broaden the indicators by which poverty is measured. There are several indicators that are relevant in this context including literacy, primary and secondary school enrolment, infant mortality rates, life expectancy, maternal mortality rates, access to potable drinking water and sanitation services. Broad-based progress on all these fronts combined with progress on the traditional income or consumption poverty measures would provide the essential base for policy aimed at meeting the poverty challenge.

Factors of Rural Poverty

Rural poverty can be encapsuled with reference to the following factors:

1. Landlessness or possession of only poor quality, non-irrigated lands.

2. Availability of intermittent, casual wage employment especially in the agricultural sector.

3. Lack of basic literacy, job skills.

4. Limited access to jobs in the non-farm sector through networks that extend outside the village.

5. Chronic indebtedness.

6. Ill health or disability, particularly of the primary breadwinner.

7. Poor quality mud and thatch housing, insecurity of housing tenure.

8. Desertion by male spouse, being widowed, or being a woman living alone without an adult male.

9. High dependency ratios, particularly in the case of those having young children, and widows without sons or with young children.

10. Low caste status as an indicator of poverty.

Deprivation of human resources is a critical dimension of poverty. Indicators of human development capture important dimensions of well-being and reflect not just the rate of growth in the economy but also levels and quality of public spending. They also broaden the picture of poverty and provide a wider arena for the fight against it. Effective public spending on basic services, e.g. education, health, water, and sanitation, can compensate for the limited ability of the poor to acquire these services through the market. However, because the impact of spending on public goods and services is not reflected in conventional measures of income poverty, progress in this arena is better reflected in outcome measures such as education and health status.

Evidently, the reality of poverty goes beyond material deprivation and takes in the ambit the deprivation of human resource. Poverty goes further beyond the shortfalls in human development. One can identify factors like vulnerability, powerlessness, exclusion, social iniquities and destitution to capture the total profile of impoverishment.

Risk Factors

The poor are at risk because they lack the income, the assets, and the social ties that protect the better-off from the impact of unexpected setbacks. Vulnerability to adverse shocks is a fact of life for poor men and women. They are distressed not only by the current low levels of resources and incomes, but also by the possibility of falling into deeper poverty and destitution. Once

destitute, it can be difficult to recover. Death, disability and disease have been cited frequently as factors linked to vulnerability. Widowhood, or more frequently, desertion by a spouse, often led to destitution in poor and low-caste women. Further, crops may fail due to poor weather conditions. Agricultural wages move with the vagaries of the local economy, and land may become eroded or salinised due to flooding or emaciation of ground water. If shocks are severe, repeated or long- lasting, a household may be forced to sell or pawn its productive assets and, in the worst cases, may fall into chronic life-long debt. Perceptions of risk and concomitant fears of destitution strongly influence the economic behaviour of both the poor and the near-poor. The threats of deprivation, starvation and hopelessness are real, not imaginary. Even when potential returns are significant, the poor may shun certain ventures if failure would exhaust their limited reserves, or draw them into debt. Relevant undertakings may include leasing cultivable land, purchasing a dairy cow, diversifying crops, or abandoning a subsistence level livelihood in order to seek a better employment.

Governance Factors

Poor public sector governance impinges disproportionately on the poor. The poor individuals and communities have access only to goods or facilities of inferior quality. The burden of a non-responsive bureaucracy falls particularly upon poor men and women. Corruption also impacts the poor disproportionally. Bribes require them to part with a larger share of their incomes than do the better-off groups. Collective action can improve the bargaining power of the poor. Even though the means of the poor are limited, they have a better chance of being heard if they work together, e.g. by forming community organizations for political action. There is little evidence that the rural poor have developed political awareness or strategies.

Social Iniquities and Economic Deprivation

Deep and continuing social iniquities plague the rural scenario. Individuals coming from a low-caste background are under-paid and often treated with derision. They are low-status agricultural labourers. They are, by and large, illiterate and their dwelling houses are not only extremely sub standard, their access to

potable drinking water and sanitation too is limited. Social iniquities erect barriers in the upward socio-economic mobility of the disadvantaged groups and have to be dealt with effectively in all policy formulations.

In varying degrees, countless groups ranging from indigenous populations in Bolivia and Guatemala to ethnic minorities in Sri Lanka and Vietnam, as well as groups and communities in such countries as Australia, Russia, and the United States, experience some form of social discrimination that impacts on economic well-being and limits the returns on the material, human and social assets which they possess. Throughout the world again, in varying degrees, there occur gender biases. Exclusion based on gender and social identity is not only deeply ingrained, it is also a powerful contributing factor to the persistence of poverty. In fact, social identity is a strong predictor of who is and who is not poor, who is illiterate, who is employed in low-paid, low-status agricultural labour, and who lives in poor dwellings with limited access to basic amenities. A poor household is often identified as one at the low end of the castes hierarchy most often a member of the scheduled caste and schedule tribes. The SCs and STs tend to possess fewer private assets, in particular, less and poor quality land, as well as lower levels of human capital. The latter trend is particularly disadvantageous in the light of difficulties in redistributing land and want of opportunities in the non-farm sector. Low-caste households are not only worse off in terms of levels of assets, but also experience lower economic returns to the minimal stock they do possess, including their human capital. There are lower returns to the land owned by the SCs/ STs, for instance.

Lack of homestead plot leaves homeless families at the mercy of the propertied landlords. Hamlets occupied by the SC/ST households tend often to be located at some distance from public facilities such as clean wells and paved roads, as well as schools, public health centers, including even Integrated Child Development Services (ICDS) and the PDS fair-price shops. Furthermore, utter landlessness, or a lack of access to fertile, well- watered agricultural land has always been a cause and characteristic of rural poverty. The SCs and the STs rarely own land and even if they do, the quality is sub-marginal and non-sustaining. The inevitable recourse is to

casual labour. A category of "attached labourers" receives a small plot of land from their land-owners and work in the latters' fields. The wage they receive is much less than the rate of the un-attached labour. The attachment, falling into a perennial debt trap, often descends on the next line in the labourer's family.

The members of the low-caste groups are clustered in less desirable and lower paid activities. Except in the case of agricultural, where all workers earn equally low wages, the SCs/STs earn less on average than do the individuals from the upper castes in all other occupations in the rural areas. Other Backward Castes and Muslims face similar, if not as extreme, earning differentials.

Gender Barriers

The gender barriers enhance the likelihood that women will fall into destitution in case of a shock such as desertion, disability, or death of the spouse. Many of the women are destitute because their gender forecloses many occupations and other opportunities to participate equally with men in political and economic life. A female agricultural labourer receives much less wages than the rate for the male counterpart for the same work. Particularly if her parents were poor, she is unlikely to be literate or to have any skills or qualifications for a viable non-agricultural employment. Female children are not enrolled in schools as educational benefits will go to the in laws' families on their marriage. Cultural taboos invariably dictate that respectable women should remain at home and not engage in work for pay, while the low caste households improve their economic condition when their women supplement family income through employment in the fields or homes of others, much is required on the female empowerment front. Cultural factors constrain women's ability to move freely in order to seek economic opportunity. In consequence, there has been a feminisation of the agricultural workforce, as there has been male migration in search of better-paid off farm employment. As men move away to seek higher wages, many of the women left behind take up casual low-paid employment in the agriculture sector. There has been little change in either the level or structure of women's employment over the past few decades. Women are typically engaged in the lowest-paid

activities, including day labour in the fields, foraging for firewood and dung, piecework, or unskilled construction work.

Since land is the main source of income and food security for the majority of rural households in many countries, the principal challenges for land administration as regards gender equity are:

a. to understand and acknowledge the complexity of property rights regimes as they relate to the dynamic roles of both men and women in today's societies; and

b. to provide effective institutional structures that can protect and strengthen equitable access to land within the framework of a society's particular land policy goals.

The following indicators may help collecting gender disaggregated information:

- Rights granted by Constitutions, statutes, and official tribunals
- Rights granted by other laws-customary, informal, secondary, temporary
- Security of the aforementioned rights in terms of enforcement and application
- Land –related or subsidiary rights that women and men are free to practice without specific mention in formal or informal laws
- Effective access to fair adjudication including the court systems or other dispute resolution processes
- Comparison by gender of the formal and informal inheritance systems and how they operate in distributing land rights and holdings
- Effective access to and participation in the local decision-making bodies
- Social status in the community based on access to land
- Role in household decision making (e.g. on income strategies, provision of food and shelter)

❖ Relative percentages of male and female population holding secure (e.g. recorded) and insecure (at will) title to land.

Examples Of Indicators for Collecting Gender Disaggregated Information: Socio-Economic Factors

Characteristics of land holdings in an area:

❖ Origins of landholdings by gender (e.g. custom, statute, occupation, inheritance)

❖ Rural and urban demography by gender

❖ Size and relative location (e.g. to transportation and other services or amenities) of land parcels and housing by gender.

❖ Acquisition through inheritance of assets other than land, by gender

❖ Percentage of population depending on agriculture for their livelihood by gender

❖ Heads of households by gender (de facto and de jure)

❖ Average number of dependants in male and female headed households

❖ Benefits, roles, and responsibilities of land tenure by household:

❖ Traditional land-related responsibilities by gender

❖ Economic aspects of land assets by gender

❖ Effective access to credit based on land assets by gender

❖ Relative participation by gender in formal and informal housing and land markets (types of transactions, procedures taken, obstacles, etc.)

❖ Beneficiaries of land sales by gender (i.e. how were the proceeds of the sale used)

❖ Economic and physical resource allocation by gender within the household

- Proportion of household food produced directly by gender
- Proportion of cash-crops produced by gender
- Percentages of paid and unpaid labour activities by gender
- Access to and use of hired labour by gender

A major indicator is legislation, such as laws for inheritance, divorce, or land use. Such an indicator can be useful but it can also be misleading since the formal legislation may not reflect what actually accepted practice on the ground is. One example is the divorce law of the socialist states that recognizes equal division of property. How well a spouse's rights might be protected on divorce, especially in impoverished rural regions, will also depend on the degree of access to the courts, ability to finance litigation, and the degree of support provided by the family or community. Similarly, calls for equal rights in the Constitutions can be quite meaningless in the light of the actual practice of local communities.

Other indicators include physical occupation or proof of the actual exercise of the rights. Again this has some difficulties in that it may not agree with the formal (legal) status and it may be difficult to observe, in a short time span, all of rights in play. Related to these indicators are measures such as: de facto head of household; primary food provider; community acceptance or agreement of someone's rights; or the share of financial and labour inputs. Even more difficult to measure objectively and completely are factors such as social status and decision-making power.

Delivery of Basic Services

Poverty is sought to be reduced indirectly by enhancing growth, and directly through the delivery of basic services, particularly in health and education and through anti-poverty programmes. Expenditure on roads, agricultural research, and education has been shown to make particularly strong impacts on rural productivity and poverty reduction. There is strong evidence to suggest that local public goods-for example, roads, communication systems, irrigation, schools and health facilities influence returns to private capital. Primarily on account of under- investment in

infrastructure and problems linked to the market environment, there is a lagging response by the agricultural sector. While agricultural terms-of-trade have improved in the 1990s, they have not resulted in improvements in productivity and product diversification or levels of output, now in lower incidence of impoverishments.

Social Relations and Networks

The poor are universally found to have least social capital (stock of relationships, networks and institutions where investment is made and which act as support pillars in times of need), and in particular fewer horizontal social ties. Most networks are open only to those who have something to contribute, which means that the poor are generally excluded. In contrast, the better –off possess a strong network of high value ties and contacts that help not only to mitigate risk and ensure welfare but also to ensure the lion's share in the enjoyment of public goods and services.

Social capital can serve 'protective' function. Associations are often formed among the groups of the poor for purposes of mutual protection. For illustration, women travel together when they go to the forest to collect firewood. Social ties can also be used for 'productive' purpose. For example, associations are often formed which help members obtain labour contracts or jobs. The poor tend to utilize the protective rather than the productive forms of social capital. Occasionally, they have banded together and built their own networks and organizations. Self Help Groups are being organized through the facilitation of the Government programme as well as non-government organizations. Women in the group contribute a meagre sum of money on a regular basis; the aggregate savings are eventually deposited in an account in a local bank. Women in the group can then borrow from the aggregate savings in times of need, and some groups have even used the accumulated savings to set up a joint business.

However, in the overall analysis, we find that the poor rarely enjoy any advantageous ties or contacts outside their own poor neighbourhoods. There are patron-client relationships with landowners or employers and occasional exchanges within the peer groups inter se in times of need. The social capital of the rural poor is hardly of the type which can alleviate poverty.

Declining Calorie Intake in Rural India

The National Sample Surveys data reveal that in rural India, the average per capita calorie intake per day fell from 2,266 Kcal in 1972-73 to 2,183 Kcal in 1993-94, it further dipped to 2,149 Kcal by the close of the last century. Among the lowest 30 per cent of rural households in respect of consumer expenditure, the per capita calorie-intake fell from 1,830 Kcal in 1989 to 1,600 in 1998. By the close of the last century, almost 77 per cent of the rural population consumed less than the poverty line calorie requirement of 2,400 Kcal. The data clearly show a decline in cereal intake, a phenomenon so clearly driven by distress, since it has occurred in a situation of declining overall calorie intake and persistence of high levels of malnutrition.

India needs to urgently take into consideration the world food scenario to prepare itself. The world grain harvest has been falling since 2004, when it was 2.68 billion tonnes to 2.38 billion tonnes in 2005, and for 2006 the Food and Agriculture Organization estimates a harvest barely exceeding two billion tonnes. The United States Department of Agriculture (USDA) estimate is more conservative at 1,984 billions. The world will have to face a shortfall of more than 58 million tonnes of what it consumes. Harvest has failed in both the US and Australia, the main wheat producers. Poor people will find food more expensive, as we are already seeing in India. Compounding the situation is that coarse grain, such as maize, is being used for ethanol production. A "corn rush" is on in the US, where the crop is used to produce bio-fuel-ethanol, strongly supported by subsidies by the Bush administration to divert world criticism for its failure to ratify the Kyoto Protocol. Developed nations, as also rapidly developing countries such as China and India are eating more meat than grains and vegetables, and it is worth mentioning that it takes 14 kg. of grains to produce two kg. of beef and eight kg. of grains to produce two kg. of pork. More than six decades after Independence, India has more persons suffering from endemic or chronic hunger, measured in terms of either calorie intake or anthropometric indicators of malnutrition, than any other country in the world. This remains the paradox of the so-called Green Revolution.

India might draw a leaf from the Chinese approach. China has 69 per cent of the total arable land under grain crops and does not permit, on any account, the shrinkage from this size. In India, the prime agricultural land is being gobbled up by land sharks for "development"- the IT parks, theme parks, five-star hotels, high-rise apartments and more importantly, the highways to accommodate more cars on the roads. In the rice-starved Kerala, prime paddy land in Palakkad district is being taken over by the cash-rich NRIs.

Food Security Spluttered

Keeping prices of foodgrains under checks is important for India, where an estimated 27% of its 1.17 billion population lives in poverty and some 240 million people depend on the farm sector directly for livelihood. With India resorting to wheat imports in 2006 for the first time since 2000, experts say it is an ominous beginning to what could eventually jeopardize the country's food security, painstakingly reached through the green revolution of the 1970s. We are in a mess and we have been very indifferent on this issue at a time when hunger is on the rise. We are importing wheat at higher prices but not ready to pay the farmers. Private traders, in fact, outscored government procurement agencies in buying and stockpiling wheat.

A two-pronged policy approach to solving food insecurity and malnutrition is needed: continued and increased growth of the agricultural sector and the effective implementation of the safety nets including nutrition interventions. In addition to the importance of increased productivity of agriculture alluded to above, policies that encourage rural investment will attract more rural landless labourers and provide meaningful employment. Policies and programmes that enhance the rural infrastructure to facilitate value addition of agricultural commodities through post harvest technologies are needed. Promotion of high value agriculture, such as livestock production, poultry, fisheries, dairy, and horticulture development particularly in the dryland regions will help improve the farm incomes. Further, it is worth pursuing the recent call by the National Commission on Farmers for diversifying sustainable livelihood opportunities along the lines of the Chinese model of Township and

Village Enterprises (TVEs) and for a "rural non-farm livelihood initiative" through agri-business centers, food parks and other rural non-farm employment programme.

Technology Generation vis-a-vis Poverty Alleviation

Although there is ample evidence that agricultural research has increased food production in India, there is an on-going debate whether agricultural research has been beneficial to the poor in alleviating poverty. Currently, the research is demand driven and caters mostly to the large or commercial farmers. Most of the technological interventions have been made in the developed countries. Many of these technologies are not affordable by the small farmers. There is skewed distribution of gains of the technologies developed in the past. The market demand for products too has changed, and product development has to take into account the market demand. The question is "how would these developments influence the well-being of the rural poor and alleviate their poverty". In the present context, there are many unanswered questions regarding the technology generation vis-à-vis poverty alleviation. Therefore, an assessment of the technologies for their viability is the need of the hour with the participation of all stake-holders.

The key issues that are to be kept in mind are as follows-

1. What is the potential of agricultural research to make the small farms more viable?

2. How can agricultural research be made more focused to alleviate poverty among the rural farmers?

3. What technologies are suitable for the rain-fed and fragile areas where many of the poor live?

4. Does the development of technologies under the diversification strategy address all the issues of the farmers?

5. What technologies are suitable for the rain-fed and fragile areas where many of the poor live?

6. Does the development of technologies under the diversification strategy address all the issues of the small farmers?

7. What is the potential of the emerging technologies, such as bio-tech (production, processing and value addition) to enhance off-farm employment in the poverty -ridden areas?

Access of the Rural Poor to Food Vectors

Ideally, a sufficient and balanced diet in a household should meet all macro and micronutrients of every individual in the household. Unfortunately, a large segment of the population below the poverty line does not meet all the nutrients through its limited diet, resulting in sub-optimal intake of vitamins and minerals exhibiting severe clinical nutrition deficiencies. To alleviate malnutrition in India it may be necessary to ensure physical and economic access to vectors of foods containing all macro and micronutrient needs to all segments of the population as per the ICMR norms. Over the years, many food-based nutrition intervention programmes were planned and implemented such as the Public Distribution System, Antyodaya Anna Yojana, Annapurna Scheme, ICDS, Mid-day meal and Food for Work. In addition, there are three major micro-nutrient intervention programmes: distribution of Iron and Folic Acid Tablets, Vitamin A supplementation and Iodised salt distribution. Paradoxically, in spite of all these, nearly 50 per cent of the children are stunted and anaemia in pregnant and lactating mothers has 80 per cent prevalence causing public health concern. Increase in population size, shrinking of arable land resources, loss of momentum in the growth of food output, inefficient bio-utilization of the nutrients consumed by the poor have been the factors responsible for the persistence of micro-nutrient deficiencies in the country. Two questions emerge here:

1. Can commonly eaten food staple crops be enriched with essential bio-available minerals and vitamins at levels that significantly improve human nutrition at lower cost than existing nutrition interventions?

2. Can farmers be induced to grow such varieties?

New and innovative plant breeding technologies help to produce micro-nutrient rich high yielding varieties of rice, wheat, maize and the like. Harnessing emerging new technologies is the need of the hour to have second green revolution. Proven bio-fortification of rice with Vitamin A and Iron are available. Genetic engineering is a powerful tool and can help in higher productivity of vegetables and fruits with improved micro-nutrient content. The private sector in the west is currently making huge investment in using these technologies to produce new plant varieties for large-scale commercial agriculture. Proven technology of fortifying salt with iron and iodine and other micronutrients is available. Fortification of wheat flour with iron and folic acid, milk with Vitamin A is now currently used in some of the Indian States. Several industries have made use of fortification technology to produce and market a number of micronutrient enriched food products and drinks for middle and upper income groups.

The fortification technology, nonetheless, has bot benefited the needy and undernourished population. The poor people cannot afford to buy the high cost micronutrient foods and drinks. For instance, salt fortified with iron and iodine has not yet been marketed or distributed to large segments of the poor population though proven technology has been available for the last 11 years. The benefits of such research in technology development should reach the community at large without which one cannot justify the investments made in the area of research especially in food technology.

Agro-Industry

India's promising agro-industry has failed to attract enough private sector participation with hardly any of the 60 proposed agri-export zones (AEZs) attracting minimal flow of funds. State-run Agricultural and Processed Food Products Exports Development Authority (APEDA) has, with the help of the state governments, demarcated 60 AEZs in the last four years to promote horticulture produce. They have failed to take off due to lack of adequate private sector participation. The zones have been created depending on the strength of a region in growing fruits and vegetables like gherkins, pineapples, vanilla, rose-onions, mangoes, grapes and flowers. A

sum of Rs. 500 million was earmarked by the Commerce Ministry in 2006 to kick-start the operations, under the Assistance to States for Developing Export Infrastructure and Allied Activities (ASIDE) scheme to bridge critical gaps in facilities. The investment flow from the private sector has, however, not been in keeping with the projections. Against a projection of Rs. 150 billion these AEZs were expected to attract in the last four years, there was an investment flow of around Rs. 8 billion till September, 2006.

India is one of the largest producers of vegetables and fruits. However, agri-exports have slumped from 18% of the total export basket in the 1990s to 10% at present.

Among the more active AEZs are those on gherkin and rose-onion in Karnataka, mango in Chittoor district of Andhra Pradesh, grapes, grape wines and mangoes in Maharashtra and floriculture in Tamil Nadu, while West Bengal is witnessing good investment flow in the processing of pineapples, mangoes and vegetables. Some of the other AEZs expected to show promise with more investment and incentives are the Litchi AEZ in Uttarakhand and a zone for medicinal plants in Kerala.

Labour Market Reforms: Equity Concerns

When the focus is on improving overall social welfare and reducing poverty, labour market interventions may act as a double-edged sword by protecting the income levels and security of those covered by the policies, the insiders, while increasing the vulnerability of the rest of the population, the outsiders, who may face increasing barriers to employment and have access only to jobs in the uncovered sector. It will leave some members of the society worse off while improving the living standards of others and will therefore have an important distributional impact. The deciding factor will be the turn of the reforms- more intervention versus liberalisation. This implies that an unregulated labour market would lead to outcomes that are inequitable and inefficient and that some form of intervention is required to increase the efficiency of the labour market and enhance the equity of its outcomes.

Reforms of the minimum wage are expected to have a typically ambiguous impact on the poverty rate. An increase in the minimum wage, for example, will typically raise the earnings of the low paid workers who maintain their jobs, and cateris paribus, this will bring the poverty rate down if these individuals are the lone earners within their households and if all low-paid earners within households maintain their employment at the pre-reform level. However, the increase is also likely to reduce employment in the covered sector, and this will result in lower labour income at the household level if any wage earners lose their jobs because of the policy or are forced to transfer to the lower-paying, uncovered sector. This may increase the vulnerability to the poverty of households that are close to the poverty line.

Reforms reducing the generosity of unemployment benefits (or raising the rewards of labour market participation) provide incentives for the unemployed to increase the intensity of their job searches. Furthermore, evidence supports the positive effect on employment and on earnings of the provision of assistance in job hunting. Evidence also points to the cost savings arising from the increased flows of people from unemployment to employment generated by the imposition of job-seeking requirements.

Wrap up & Recommendations

Farm Growth: the key to Sustained Development

For the overall national economy to maintain its growth momentum on a sustained basis, the farm sector would have to play a more important role. The real GDP growth in the farm sector in recent years has been low and volatile. Against the Tenth Plan GDP growth target of 4 per cent per annum for the sector, the actual farm growth during the first four years of the Plan period averaged only 2 per cent per annum.

Hence, the most formidable challenge is to rejuvenate the agriculture sector through concerted efforts aimed at stepping up investment to improve irrigation facilities, use of water resources and rural infrastructure. The time is now ripe for a second Green Revolution with an emphasis on diversifying the farm sector further

to capture new market opportunities. Agricultural growth in the years ahead will have to largely come from improvements in the productivity of diversified farming systems with regional specialisation and sustainable management of natural resources, especially land and water.

As regards water, in actual fact, irrigated area has stopped growing in this decade. In 1999-2000, the net irrigated area was 57 million ha; the gross area was 78 million ha. It was 56 million and 77 million ha in 2001-02 and 53 million and 71 million ha in 2002-03. The debacle implies the failure of the Advanced Irrigation Benefit Programme. Under the first programme in 1975-76, the irrigated area went up by 5 million ha. Reinvented in 1987-88, it again worked and, over a brief period, the irrigated area went up by around 5 million ha. There has been very little progress since. We need a serious professional evaluation of the AIBP's failure. One reason for its failure appears to be not including a component to cover the last mile of water deliveries. Yet another reason is bringing in a loan component and not keeping it a Central Plan scheme.

Managing Risks in Agriculture

Without state controlled prices, the farmers can respond to the opportunities provided by the market. But this normally happens with a lay farmers' choice of a crop influenced by prices before they start sowing. When prices of a particular crop are high they all tend to move towards that crop. This invariably leads to overproduction so that prices crash, leading farmers to move away from that crop the next year. This, in turn, leads to a shortage forcing prices up and attracting farmers in the succeeding year. This cycle that has been well established in sugar is now set to dominate other crops, including wheat.

If a farmer knows what price he will get at the time of harvest, he would not have to go simply by the price at the time of sowing. But for this system to work well there would have to be a continuous link between the farmers and the futures markets. Prices in the futures markets will drop when the sowing of a certain crop goes beyond a certain level, thereby discouraging more farmers from opting for the same crop. Without such a link futures markets tend

to be dominated by speculators alone, who tend to push up the prices of commodities when they are rising and push them down when they are falling. There is already a vociferous demand for a ban on futures markets.

Farmers will then be left without the protection of either guaranteed procurement or an effective futures market. They will have to absorb the entire risk. And their ability to absorb risk is being continually weakened by one unavoidable natural factor: the limited availability of land. The net area available had been stagnant for decades. The scope to increase gross area by going in for more than one crop is also limited by the growing pressure on water resources. And since the percentage of population dependent on agriculture is not declining as sharply as this sector's share of the GDP, the buffer available to each farming family to absorb risk is, in fact, under constant pressure.

Risk absorption could be done by reducing the number of family members dependent on farming. The National Rural Employment Guarantee Scheme (NREGS), for instance, could link the employment of one member of each family not just to state projects but also private industry, if need be, by providing training to the worker and incentives to industry. The crisis in agriculture demands a vision that extends not just to the entire sector but also to its potential links with the rest of the economy.

The Government of India has almost succeeded in advocating the states to free marketing of agricultural produce from governmental regulation. Various states have been asked to amend their Agricultural Produce Marketing Committee (APMC) Acts and many states have already done so. The Centre's intention is to enable private sector participation in a big way in the procurement, marketing and selling of farm produce, with the retail bandwagon catching up. Industry bigwigs like Reliance intending to benefit from the huge market potential- vegetables and fruits-hold for a burgeoning urban and urbanised middle class and up-market consumers. Whether the Centre's enthusiasm to help private participation proves to be beneficial to the farmers as well, is a big question.

The farmers are already at the receiving end where private speculators operate as in the forward and futures commodities markets. The spot markets have not been linked with the forward and futures markets to receive price signals. This linkage seems to be poor due to the domination of the speculators. The ban on forward contracts in rice and wheat announced by the Union Finance Minister in his budget speech (February, 2007), was necessitated by a frightening trend of price rise.

Employment Activation Policies

Empirically, activation policies for women returning to the labour market have been found to be the most successful, especially when they take the form of assistance in job-seeking, counseling, and training directed at facilitating an immediate return to employment. In particular, there is evidence that training per se has very little effect; constant monitoring and testing of employment activity are crucial.

Over and above the effects of financial incentives, the Canadian Self-Sufficiency Project and the Minnesota Family Investment Project in the United States (both targeted at welfare recipients) were designed specifically to test the incremental effects of policies aimed at early reintegration into employment, primarily assistance in job-seeking, then short-term training and job counseling. The incremental effect of these policies on employment seems large; up to a 7 percentage point increase in employment rates in the case of the Self-Sufficiency Project and nearly a 10 percentage point increase in the case of the Minnesota Family Investment Project. There are also positive effects on earnings. Assistance in job-seeking and related activities is also being regarded as cost-effective.

Building Capabilities and Enhancing Opportunities

People need capabilities, opportunities and functional institutions of various kinds. The broader the base of building individual and institutional capability and enhancing varied opportunities, the better it is for all participants. This process will necessarily entail structural change of the economy. Agriculture

accounts for 18% of the GDP now, but 61% of all workers live off it. Urbanisation, food processing industries involving shortage, transportation and cold chains and organised retail will diversify the occupational structure of rural India fairly fast. Such diversification will break the traditional correlation between caste and occupation and attack the basis of caste. The modern economy also reconfigures group identities, breaking up traditional notions of community and forging new ones.

To sum up, agricultural production in India has been under pressure for awhile, but food shortages are now beginning to affect prices. Agriculture with less than a fifth of the GDP has to provide livelihoods for around three-fifths of the population. The political fall-out of this imbalance has now reached a point where the entire SEZ policy has had to be put on hold. There has been an official recognition in the budget speech (February 2007) of the Union Finance Minister that the crisis in the farming sector cannot be ignored. How best to translate this concern into a meaningful strategy remains the challenge. The way out of the land conundrum lies with farmers' groups, stakeholder organisations and cooperatives playing a larger role in strategic partnerships with business groups. The more we encourage organisations of smaller producers to organise their interests and strategies their relations with large companies, the better and more enduring will be the systems we create. Relocation of land will be the most vexed questions in India in the years to come. The more we build up transparent institutions at the local level in working out the details of the solutions to these questions, the better anchored will be a sensible re-hab policy that has to be both dynamic and responsive.

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CHAPTER 3

FARMERS' SUICIDES

Nearly 7000 farmers committed suicide in different parts of the country during the period 2003-04 to 2006-07 (upto November 2006). Of the affected states, Maharashtra, which was singled out by the Prime Minister for a special fact-finding visit, registered a tremendous increase in suicide by farmers with the toll rising from 577 in 2005 to 1843 according to the figures compiled by the State Government till October 31, 2006. Table-1 shows cases of suicides by the farmers in various States (as reported by the State Governments):

Table 1: Statement Showing Cases of Suicides by Farmers in States

Sl.	Name of the State	Period	No. (Based on the figures reported by the State Government)
1.	Andhra Pradesh	2003-04 2004-05 2005-06 2006-07 (upto November)	393 1126 378 104
2.	Karnataka	2003-04 2004-05 2005-06 2006-07 (upto November)	708 271 152 71
3.	Maharashtra	2003 2004 2005 2006 (upto October 31)	173 622 577 1843
4.	Tamil Nadu	2000-2006	26
5.	Punjab	2003 2004 2005	13 11 6
6.	Kerala	2003 2004 2005 2006 (upto December)	50 101 119 98
7.	Gujarat	2003 2004 2005 2006 (upto May)	3 7 7 1
		Total:	6860

Rehabilitation Package for Distressed Farmers

Broadly, the following causes have been identified for the rural distress: indebtedness, crop failure, drought and social and economic insecurity. The Government of India has recently approved a rehabilitation package for 31 districts in the four States of Andhra Pradesh, Maharashtra, Karnataka and Kerala (as per details below) where higher numbers of farmers' suicides have been reported.

Districts Identified:

Maharashtra – 6 Districts: Akola, Wardha, Amravati, Buldana, Wasim & Yavatmal

Karnataka – 6 Districts: Belgaum, Hassan, Chitradurga, Chikmaglur, Kodagu & Shimoga

Kerala – 3 Districts: Wayanad, Palakkad & Kasargod

Andhra Pradesh – 16 Districts: Prakasam, Guntur, Nellore, Chittoor, Cuddapah, Ananthapur, Kurnool, Adilabad, Karimnagar, Khammam, Mahbubnagar, Medak, Nalgonda, Nizamabad, Rangareddy & Warangal

The Rehabilitation Package

The rehabilitation package will be implemented over a period of 3 years and includes both immediate and medium term measures. It aims at establishing a sustainable and viable farming and livelihood support system through debt relief to farmers, improved supply of institutional credit, crop-centric approach to agriculture, assured irrigation facilities, watershed management, better extension and farming support services, improved marketing facilities and subsidiary income opportunities through horticulture, livestock, dairying, fisheries, etc. For alleviating the hardship faced by the debt stressed families of farmers, ex-gratia assistance from the Prime Minister's National Relief Fund has been approved @ Rs. 50 lakh per district.

Amount involved

The package involves a total amount of Rs. 16978.69 crore consisting of Rs. 10579.43 crore as subsidy/ grants and Rs. 6399.26 crore as loan. State-wise break-up of this amount is given below:

Andhra Pradesh	–	Rs. 9650.55 crore
Karnataka	–	Rs. 2689.64 crore
Kerala	–	Rs. 765.24 crore
Maharashtra	–	Rs. 3873.26 crore

Implementation Mechanism

1. State Level Coordination and Supervision Committee including representatives of the Government of India and the State Government.

2. Implementation through District Level Committee and Panchayati Raj Institutions.

3. Local level institutional structures and special purpose cooperatives/ community-based organizations.

Approval of Package

- Package for Maharashtra was announced by the Prime Minister on 1.7.2006.
- Package for Andhra Pradesh, Karnataka and Kerala was approved by the Union Cabinet on 29.9.2006.

Progress of the implementation of the package (as on 20th March, 2007)

A. Credit Related Measures

(i) Debt Relief to Farmers

(Rs. in crore)

Name of the State	Loans to be rescheduled Amount	Loans rescheduled		Fresh loans given against loans rescheduled	
		No. of Accounts	Amount	No. of Accounts	Amount
Andhra Pradesh	5745.76	1053766	7533.17	126533	58.17
Karnataka	1194.52	204160	1224.93	42721	758.97
Kerala	815.53	NA	347.02	NA	NA
Maharashtra	1296.00	929020	1384.38	484334	669.67
Total	9051.81	2186946	10489.50	653588	1486.81

(ii) Interest Waiver

(Rs. in crore)

Name of the State	Overdue interest to be waived	Overdue interest waived
Andhra Pradesh	1436.44	1992.18
Karnataka	209.81	689.15
Kerala	360.00	324.19
Maharashtra	712.68	808.44
Total	2718.93	3813.96

(iii) Credit Flow (1 April, 2006 to 28 February, 2007)

(Rs. in crore)

Name of the State	Target	Disbursement
Andhra Pradesh	13817.78	11734.97
Karnataka	3076.20	2307.43
Kerala	1945.07	1962.81
Maharashtra	2583.39	1902.71
Total	21422.44	17907.92

B. Assured Irrigation Facilities

I. Major Irrigation

(Rs. in crore)

Allocation				Allocation for 2006-07	Progress	
Physical			Financial	Financial	Expenditure by State Government	Release by GoI
Original Package	Additional	Total				
State						
Andhra Pradesh						
04	10	14	3233.00	1078.00	802.56	139.44
Karnataka						
04	05	09	1204.05	401.35	-	-
Kerala						
-	01	01	-	NA	-	-
Maharashtra						
08	-	08	1260.43	420.14	293.00	2.03
Total						
16	16	32	5697.48	1899.49	1095.56	141.47

II. Medium Irrigation

(Rs. in crore)

Allocation				Allocation for 2006-07	Progress	
Physical			Financial	Financial	Expenditure by State Govt.	Release by GoI
Original Package	Additional	Total				
State						
Andhra Pradesh						
06	05	11	325.00	108.33	118.64	114.04
Karnataka						
01	07	08	04.66	2.05	-	-
Kerala						
01	04	05	35.00	11.66	-	-
Maharashtra						
09	-	09	468.15	156.05	NA	38.01
Total						
17	16	33	832.81	278.09	118.64	152.05

III. Minor Irrigation

(Rs. in crore)

Allocation under package		Allocation for 2006-07		Progress	
Physical	Financial	Physical	Financial	Expenditure by State Govt.	Release by NABARD
State					
Andhra Pradesh					
932	2231.00	310	744.00	49.40	274.03*
Karnataka					
897	458.10	299	152.70	Nil	2.32*
Kerala					
179	70.03	60	22.34	Nil	-
Maharashtra					
557	448.68	186	149.56	323.38	117.59*
Total					
2565	3207.81	855	1068.60	372.78	393.94

* Sanctioned by NABARD, money being released.

Seed Replacement Programme

Action Points:

❖ Launching of Massive Seed Replacement Programme with 50% subsidy.

❖ The entitlement for quality seed to be increased from half acre per farmer to one hectare per farmer

Progress:

Allocation		Season	Seeds supplied		Amount released
Package	2006-07		Agency	Quantity (lakh qtls)	
State					
Andhra Pradesh					
470.18	156.72	Rabi (2006-07)	A.P. State Seeds Dev. Corporation	1.55 (certified)	47.36
Karnataka					
178.00	59.33	Summer (2006-07)	NSC & Karnataka State Seeds Corporation	0.022	0.87
Kerala					
1.92	0.64	-	-	-	-
Maharashtra					
180.00	60.00	Rabi (2006-07)	NSC/ Maharashtra State Seeds Corporation	1.12	25.46
Total					
830.10	276.69			2.692	73.69

Seed Replacement Programme – Target for Kharif 2007:

State	Target	
	Physical (Qty in lakh qtls)	Financial (Rs. crore)
Andhra Pradesh	10.15	159.82
Karnataka	5.94	86.40
Kerala	0.13	0.96
Maharashtra	3.56	44.69
Total	19.78	291.87

Watershed Development

Check Dams

500 check dams per year per district over the next three years.

(Rs. in crore)

State	Allocation under package		Allocation for 2006-07		Progress*	
	Physical	Financial	Physical	Financial	Physical	Financial
A.P.	24000	480.00	8000	160.00	Nil	Nil
Karnataka	9000	180.00	3000	60.00	Nil	Nil
Kerala	4500	90.00	1500	30.00	Nil	Nil
Maharashtra	9000	180.00	3000	60.00	360	7.20
Total	46500	930.00	15500	310.00	360	7.20

* State Governments have assured to achieve the target for 2006-07 by 31 March, 2007.

Watershed Development Programme

Treatment of 15000 ha per district per year under the watershed development programme on full grant basis out of WDF created in NABARD.

(Rs. in crore)

Allocation under package		Allocation for 2006-07		Progress*	
Physical (lakh ha)	Financial	Physical (lakh ha)	Financial	Physical (ha)	Release by NABARD
State					
Andhra Pradesh					
7.20	432.00	2.40	144.00	56574.27	6.26
Karnataka					
2.70	162.00	0.90	54.00	19513.00	0.29
Kerala					
1.35	81.00	0.45	27.00	-	-
Maharashtra					
2.70	162.00	0.90	54.00	7340.66	2.05
Total					
13.95	837.00	4.65	279.00	83427.93	8.60

* State Governments have assured to achieve the target for 2006-07 by 31 March, 2007.

Rain Water Harvesting Scheme

1000 structures per year per district for SC/ ST small and marginal farmers.

Rs. in crore)

State	Allocation under package		Allocation for 2006-07		Progress*	
	Physical	Financial	Physical	Financial	Physical	Financial
A.P.	48000	48.00	16000	16.00	24	0.03
Karnataka	18000	18.00	6000	6.00	Nil	Nil
Kerala	9000	9.00	3000	3.00	Nil	Nil
Maharashtra	18000	18.00	6000	6.00	169	0.53
Total	93000	93.00	31000	31.00	193	0.56

* Reason for poor progress under rain water harvesting scheme was discussed with the State Governments on 6 February, 2007. It was informed by the State Governments that they are already operating such schemes providing for 100% subsidy.

Horticulture Development

Action Points:

- To include all the districts under the NHM.

- Steps to address problems relating to citrus production, protection, post harvest technology and processing in the six districts of Vidarbha through a Technology Mission.

Progress

(Rs. in crore)

State	Allocation under package		Allocation for 2006-07		Progress	
	Physical	Financial	Physical	Financial	Physical	Financial
A.P.	-	75.30	-	20.30	NA	50.00
Karnataka	-	106.15	-	35.38	NA	44.54
Kerala	-	46.33	-	15.44	NA	14.63
Maharashtra	-	225.00	-	75.00	NA	21.20
Total	-	452.78	-	146.12	NA	130.37

❖ All the identified 31 districts have been included under the NHM.

❖ National Research Centre on Citrus (NRCC) has submitted a proposal to be funded under NHM. An amount of Rs. 108.00 lakh has been approved for implementing the technology mission on citrus by NRCC, Nagpur during 2006.07. Rs. 64.00 lakh has been released to NRCC, Nagpur.

Micro Irrigation

Rs. in crore)

State	Allocation under package		Allocation for 2006-07		Progress	
	Physical (lakh ha)	Financial	Physical (lakh ha)	Financial	Physical	Financial
A.P.	4.27	640.00	1.42	213.33	NA	80.00*
Karnataka	0.430	64.00	0.153	23.00	NA	08.28
Kerala	0.130	19.53	0.043	6.51	NA	06.36
Maharashtra	0.534	78.00	0.173	26.00	NA	12.18
Total	5.364	801.53	1.789	268.84	NA	106.82

* NABARD has sanctioned Rs. 136.87 crore under RIDF to the State Government for Micro Irrigation Scheme.

Extension Services

Action Point:

- ATMAs to be operationalized in all districts.

Progress

(Rs. in crore)

State	Allocation under package		Allocation for 2006-07		Progress	
	Physical	Financial	Physical	Financial	Physical	Financial
A.P.	16	8.00	16	8.00	16	4.67
Karnataka	06	3.00	06	3.00	06	-
Kerala	03	1.50	03	1.50	03	1.17
Maharashtra	06	3.00	06	3.00	06	3.83
Total	31	15.50	31	15.50	31	9.67

Subsidiary Income

Action Points:

- Induction of 1000 high yielding milch animals per district with 50% subsidy (balance bank credit).
- Induction of 500 female calves per district providing 50% of rearing cost.
- Supply of fodder blocks for feeding inducted animals with 25% subsidy.
- Establishment of four-fodder block making units with 50% subsidy (balance bank credit).
- Provision of adequate health care to all animals.
- Taking up massive AI programme and estrus synchronization of 70% breedable animals.

❖ Establishment of 10 milk chilling plants.

❖ Taking of fisheries in 100 hectares per district providing 40% of capital and input cost, rest to be sourced through bank credit.

Progress

(Rs. in crore)

State	Allocation under the package	Allocation for 2006-07	Funds required by State	Release by GoI	Physical progress
Andhra Pradesh	263.63	87.42	43.71	29.98	Tender issued for purchase of animals. Induction will start in March, 2007.
Karnataka	98.87	32.78	19.67	17.70	Committee for selection of beneficiaries formed in each district.
Kerala	49.43	16.39	8.20	5.78	Beneficiaries short-listed.
Maharashtra	135.00	32.78	16.39	17.49	4157 milch animals purchased.
Total	546.93	169.37	87.97	70.95	

Planning Commission's Study of the Vidarbha Region in Maharashtra

A Fact Finding Team was constituted by the Planning Commission on March 2, 2006 at the behest of the Prime Minister, to study the situation regarding disparities in regional development, to recommend necessary measures for reducing regional disparities in Maharashtra and for addressing the issue of rural distress, especially in the Vidarbha region. The Team submitted its report on May 30, 2006. Visiting the six acutely distressed districts, namely, Wardha, Yavatmal, Akola, Buldana, Washim and Amravati, the Planning Commission Team found astounding evidence of years of continued neglect of the Vidarbha region and its people. The investment backlog has to be pegged at Rs. 8238.94 crores at 1993-94 prices and Rs. 14434.64 crores at 2003-04 prices. A time-frame of 5 years may be fixed for the removal of backlog taking into consideration the

overall resource position of the State and the absorptive capacity of various sectors for incurring expenditure.

The Team analyzed the various reasons for distress in the region. There was ample evidence of distress due to lack of procurement of cotton, loss due to lower price realization and low yield.

The flooding of the rural areas by open market input dealers for seeds, pesticides, etc. has led to an increase in the distress. Although only 15% of the area was found to be under Bt cotton, nonetheless, the farmers had invested in seeds which were spurious. There was wrong or uniformed choice by the farmers in adopting varieties of seeds which were not suitable for rainfed conditions coupled with the last 3 years of low rains in an otherwise assured rainfall area. The seed packets clearly carried the sticker that they were best under rainfed conditions, but the farmers did not pay heed to this as the letters were small. The yield became lower. The farm practices followed were questionable as there was mix-up of different quality of seeds in an attempt to fully sow the land under cotton. The farmers often used 1 packet of Bt cotton and an additional packet of Desi or other hybrid cotton. There was a depression in quality and in the realization of prices.

The immediate trigger of the present distress was the sudden shock faced by the farmers due to the withdrawal of monopoly procurement which had been in vogue for the past two decades. The Monopoly Cotton Procurement Scheme (MCPS) had been in operation since 1972-73 in Maharashtra. Under this scheme, cotton procurement was the monopoly of the MSCCGF (Maharashtra State Cooperative Cotton Growers' Federation) and the farmer was not only assured of the MSP, but also received a bonus if the MSCCGF made profit. Unfortunately, despite more than three decades of monopoly procurement by the MSCCGF there appear to be only lost opportunities in terms of building close relationship with the farmers. Neither in the development of appropriate farm practices nor in pursuing the goals of good quality bales has the Federation stepped in to assist the farmers. Productivity did not improve nor did competitiveness. Procurement was often through middlemen acting on behalf of the farmers. When market prices fall the farmers need

support. Cotton is no longer remunerative due to heavy export subsidy by the USA. Similar subsidies by European producers have led to a depression in the international prices. Low international prices have a dampening effect on domestic cotton prices. This too is a fact that the Maharashtra Cotton Federation has been running into over Rs. 5000/- crore losses. There is a dire need for credit, not through the decrepit cooperative banks but through NABARD. The farmers being on the default list, no fresh credit is forthcoming.

The Planning Commission Team has recommended the following measures for an overall development of the Vidarbha region:

A. Short Term and Immediate Measures (immediate to one year)

1. Distribution of appropriate seeds
2. Advisory work and extension
3. waiver of institutional credit
4. disciplining unlicensed moneylenders
5. Streamlining institutional credit flow
6. Water harvesting and conservation
7. Investment backlog and its implementation
8. irrigation backlog

B. Intermediate Measures (within two years)

1. Regional development plans
2. Allocations to become visible
3. Earmarking of allocations both by the State and by the Planning Commission
4. Reporting by the State Government on key issues
5. Consumer protection movements and systems

C. Long Term Measures

1. Procurement and pricing
2. Value addition of cotton
3. Empowerment of farmers/ growers
4. Contributory fund and self help groups
5. Crop insurance

It is notable that within the Vidarbha region, Yavatmal district witnessed 282 farmer suicides during the first 11 months of 2006. Buldana, with 248 suicides, Amravati with 208, Akola with 146, Washim with 142, Wardha with 132 suicides, and more farmer suicides being reported from these districts continue to put a question mark on the effectiveness of the government's measures[1].

It has been observed that "no mechanism has been put in place to monitor the progress of the implementation of the Prime Minister's special package for the farmers of 31 suicide-prone districts across Andhra Pradesh, Karnataka, Kerala and Maharashtra, according to the reply furnished by the Union Agriculture Ministry to a set of questions posed by this newspaper under the Right of Information Act[2]". According to the newspaper story:

"The reply then mentioned ex-gratia assistance from the Prime Minister's Natural Calamities Relief Fund of Rs. 50 lakhs per district, debt relief for farmers, and an estimated credit flow of Rs. 1275 crores for the current financial year 2006-07. Notably, the reply failed to include what percentage of the credit flow in the same financial year has already been achieved".

"Regarding interest waivers, it said, the overdue interest on agricultural loans as on June 30, 2006, amounting to Rs. 712 crores, will be waived. The burden of waiver will be shared equally between the Central and State Governments".

"The reply blandly repeated the special package announcement that 1.59 lakh hectares will be brought under assured irrigation facilities at a cost of Rs. 2177 crores over a period of three years

through completion of all major, medium and minor irrigation projects."

"The package included a massive seed replacement programme and the Ministry's reply fails to quantify what is the progress achieved, despite mentioning it. Though the package advocated watershed development and construction of check dams, none of the four States has so far begun work on check dams, according to Ministry sources. However, the reply says, "500 check dams every year will be constructed over the next three years". The watershed development programme has also not made much headway in the four States. The note throws no light on the progress of subsidiary income programmes like livestock, dairies and fisheries. Though the internal Agriculture Ministry action plan for the implementation of the package called for monitoring committees to be set up by respective State Governments, only the Andhra Pradesh Government's monitoring committee has reported to the Centre so far, according to Agriculture Ministry sources"[3].

Case Reports

(i) Land Acquisition and Farmer's Suicide in West Bengal

Death re-visited Singur (West Bengal) when a farmer, whose land had been acquired by the State Government for the Tata Motors' small car project, committed suicide on May 25, 2007. Prasanta Das (39), a resident of Khasheberia village had 4.5 bighas of land that fell within the site of the Tata Motors project at Singur.

His family members revealed that being a member of the Krishi Jami Rakha Committee (KJRC), he had refused to accept the compensation that the State Government had offered for his land.

On March 13, another farmer Haradhan Bag had committed suicide in Singur[4].

(ii) Farmer's Suicide in Prosperous Western Uttar Pradesh

A farmer Kedar Singh committed suicide on May 2, 2007 at Bhilavali in Agra. He was debt-ridden. Threatened by the

moneylender, distressed by crop failure and swindled by the man to whom he had sold away his land, the Dalit Western Uttar Pradesh farmer ended his life. After a visit to Kedar's house, located about 25 kms. from the Taj Mahal town, one gathers that perhaps both grinding poverty and oppressive social structures combined to kill the Jatav farmer on May 2. Kedar's relatives said that the cultivator was conned by a fellow upper caste villager, who had bought his entire land 1.75 bighas, to be precise.

Under provision 157A of the 1950 Zamindari Abolition and Land Reforms Act in U.P., agricultural land owned by the Schedule Castes cannot be sold to a non-SC without obtaining permission from the district administration. The provision was introduced by Chaudhari Charan Singh, the State's CM in the late 1960s. Villagers said the buyer, a Brahmin of adjoining Chhoti Bhilavali hamlet, had side stepped the rule through a benami transaction involving another SC villager. He promised to pay Kedar in a few days but never did.

Immediately after selling off his land, Kedar had also taken loan from a village Thakur to bear the cost of his aunt's mrityubhoj (death feast). He was hoping to repay the moneylender from the land deal. On discovering that he had been conned, he was miserable.

"The day before he killed himself, the Thakur (from whom Kedar borrowed money) not only demanded his money back but also abused and intimidated him", says Rajan Devi, Kedar's wife. She has two daughters: one is three year old, the other just 10 months. Bhilavali is a Thakur-dominated village. Undeniably, the Jatav family is living in a shadow of fear. Kedar's brother Ball Sinha is unwilling to talk about the land deal. Only his wife speaks out on the subject. "Even yesterday, the Thakur came and threatened us", she says.

Experts point out that a land mafia has emerged in these parts. "They have village agents who encourage and coerce marginal farmers to sell their land", says Ved Tripathi, Director, Institute of Rural Development, Agra University. The January 2007 hailstorm that struck these parts had adversely affected the wheat crop. Tripathi said the overall produce was very low. Driven to a corner, Kedar opted to sell his land. Sadly, he was conned.

According to Tripathi, the condition of small farmers in these parts is hardly any different from their Vidarbha counterparts. He says fragmentation of land holdings has made agriculture unprofitable. Costs have multiplied due to high-priced seeds, pesticides and fertilizers. The agriculture expert estimates that cultivation costs have gone up eight fold in the past 10 years. "Cultivating one bigha of wheat now costs Rs. 6000. A decade ago, it was Rs. 800. Even if we take inflation into account, that's a huge jump", he says[5].

The Plight of Bereaved Families in Karnataka's Mandya District

(i) Jayalakshmamma is a marginal farmer whose husband H. M. Krishna, 45, killed himself in Huluganahalli village of Mandya district four years ago. This district was among the worst affected by the farm suicides of 2003 in Karnataka. In this State, her BPL (below the poverty line) card entitles her to only four kg. of rice (and a kg. of wheat) a month. True, those four kg. are subsidized by the State. But she cannot afford to buy a lot more than that at the prevailing market price. She is also one of over a lakh of women across India who have lost their husbands in suicides arising from the farm crisis these past 14 years.

Jayalakshmamma's daughter now works at breadline wages in a Bangalore garment company. At most she can send Rs. 500/- in a year to her mother. This leaves her son and herself at home. They own 0.4 acres of land. After Krishna's suicide, they sold all their livestock. They have been paying off his loans and most of the compensation they received went away like that. The son Nandipa grazes the goats of others but there is no daily income from it. Instead, they will share the offspring of the animals, if any, with the owners. Jayalakshmamma herself makes Rs. 35 a day working off season. She wanted Nandipa to study. But he was in despair.

"All widows have problems. But those bereaved by the farm crisis suffer worse", says Sunanda Jayaram, President of the women's wing of the Karnataka Rajya Ryuthu Sangha (Puttanaiah group). "Even after losing her husband she has to maintain his father and mother, her own children and the farm-with no economic security for

herself. And she is saddled with his debts. Her husband took his own life. She will pay the price all her life".

(ii) In Bidarahosahalli village, Chikktayamma's state exemplifies this. Her husband, Hanumegowda, 38, killed himself in 2003. "The debts are all we're left with", she says, without self-pity. "What we earn won't pay off even the interest on loans to the moneylenders". She has struggled to educate her three children – who might be forced to drop out though all want to study further. "The girls should study, too. But later, we'll have to raise lots of money for their marriages as well".

One girl, Sruthi, has done her SSLC exams and another, Bharathi, is in the second year of her pre-university course. Her son Hanumesh is in the 8th standard. Her husband's mother and a couple of other relatives also live in this house. Chikktayamma is the sole breadwinner for at least five people. "We have only 1.5 acres (on part of which she grows mangoes). So I also work as a labourer, when I can, for Rs. 30 a day. I had a BPL card but they (the authorities) took it from me saying "we'll give you a new card". It never came back. Instead, they gave her an APL (Above Poverty Line) card.

(iii) In Huligerepura, Chenamma and her family grapple with a debt of over Rs. 2 lakhs left by her husband Kadegowda, 60, who took his life four years ago. "Sugarcane just sank and it crushed him", says his son Sidhiraj. "We have only three acres", says Chenamma. "It's hard to generate a living from that now". But she and her sons still try. And the family plans to shift to paddy this year.

These and all other farm women are breadwinners and have always been so. Yet they have no land rights and no land security. Even in agricultural labour, they are paid far less than men. Those widowed by the suicides are in constant tension. There are debts hanging on their heads which they did not incur. There are daughters whose marriages are pending. The pressure is unending. It is. But all the three women and many more like them in Mandya stand up to it with incredible resilience and still try to run their farms and feed their families with dignity and respect[6].

Summing Up

Efforts to stem suicides by the farmers, including the special package for 31 districts, have not yielded the desired results. Hastily devised packages that later prove to be difficult to monitor and implement, may become counter-productive. Distress-prone States tend to put forward wish lists that are impossible to cater to. Other States might demand the same or cry foul. Any plans to help States on issues like irrigation, power, seeds, fertilizer and cropping patterns must include clear-cut responsibilities for the governments receiving assistance. This must be a part of the funding commitments. Rural impoverishment continues to be the Achilles heel of a government that claims to speak for the aam aadmi. While there are bound to be common concerns over sluggish growth in agriculture, endemic problems of cheap and accessible credit to farmers as well as the need to modernize the sector, in the overall assessment, there will be no substitute for a State-specific approach[7].

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CHAPTER 4

SUSTAINABLE GROWTH IN CROP PRODUCTION

The distribution of farm holdings is dominated by small and marginal farmers. Rain-fed agriculture constitutes about 60 per cent of the net sown area of India. These areas are the major domain of oilseeds, pulses and coarse cereals production. The intensity and distribution of rainfall determine the crop prospects in a majority of the areas. The performance of the south-west monsoon on an all-India basis has been satisfactory with some inter-state/ region aberrations. The seasonal rainfall from June to 30 September 2006 was 99 per cent of its Long Period Average (LPA). Excess or normal rainfall was received in 32 out of 36 meteorological sub-divisions. Heavy rains during August-September 2006 in the states of Gujarat, Rajasthan, Maharashtra, Andhra Pradesh and Madhya Pradesh led to inundation/flooding in several parts of these states, affecting a sizeable area of crops.

Agriculture, especially crop production is the mainstay of the Indian economy, which supports about 115.5 million farm families. A variety of crops is grown under diverse climatic situations in different cropping systems. Rice-wheat is the main cropping system of Indo-Gangetic Plains in North-West-East India. Rice is the prevalent crop in the coastal belt of the eastern and southern states. A cotton-based cropping system is predominant in the rain-fed conditions of central, southern and western India and the irrigated areas of the northern and western region. Sugarcane is predominantly grown in Uttar Pradesh, Maharashtra, Tamil Nadu and Karnataka.

Late monsoon rains during September 2006 in several states have not only brightened the production prospects of Kharif crops but also triggered the early sowing of crop on residual moisture during Rabi, especially wheat in Madhya Pradesh, Maharashtra and Rajasthan. Rains during the second week of February 2007 have further brightened the production prospects of Rabi crops, particularly wheat.

The production of Kharif food grains during 2006-07 is estimated at 209.17 million tonnes (second advance estimates) which is higher than 208.59 million tonnes estimated during 2005-06.

The production of rice is estimated at 90.13 million tonnes compared to 91.79 million tonnes during the previous year. The production of wheat is estimated at 72.50 million tonnes which is higher than the previous year's production of 69.35 million tonnes. The production of coarse cereals is estimated at 32.02 million tonnes, which is lower than the previous year's production of 34.06 million tonnes.

Sugarcane production is estimated to be higher at 315.53 million tonnes (first advance estimates), as against 281.17 million tonnes during the previous year. Cotton production is estimated at 209.64 lakh bales during 2006-07, against 189-99 lakh bales during 2005-06. The production of jute and Mesta during the year 2006-07 is estimated at 113.90 lakh bales of 180 kg. each as against 108.40 lakh bales of 180 kg. each during 2005-06.

The national target for food grain production has been fixed at 220.00 million tonnes for the year 2006-07. The crop-wise break up of the targets of production is as under:

(Million Tonnes)

Crop	Kharif	Rabi	Total
1. Rice	80.78	12.02	92.80
2. Wheat	-	75.53	75.53
3. Jowar	4.28	3.33	7.61
4. Bajra	8.55	-	8.55
5. Maize	12.54	2.85	15.39
6. Ragi	2.79	-	2.79
7. Barley	-	1.65	1.65
8. Small Millets	0.53	-	0.53
9. Total Food Grains	28.69	7.83	36.52
10. Total Pulses	5.78	9.37	15.15
Total food Grains	115.25	104.75	220.00
11. Cotton *	185.00	-	185.00
12. Jute **	101.20	-	101.20
13. Mesta**	11.60	-	11.60
14. Sugarcane (Cane)	-	-	270.00

* Lakh bales of 170 kg. each

** Lakh bales of 180 kg. each

Oil Seeds, Pulses, Oil Palm & Maize

During the Tenth Plan, the Department of Agriculture and Cooperation restructured the development programmes of oilseeds, pulses, oil palm and maize into a centrally-sponsored integrated scheme of oilseeds, pulses, oil palm and maize, which is being implemented in 14 major states for oilseeds and pulses; 15 states for maize; and 10 states for oil palm. Further, a central sector scheme of integrated development of tree-borne oilseeds is being implemented through the National Oilseeds and Vegetable Oils Development (NOVOD) Board.

Integrated Scheme of Oilseeds, Pulses, Oil Palm and Maize:

The scheme provides flexibility to the states in implementation based on a regionally differentiated approach, to promote crop diversification and to provide focused approach to the programmes. Under the scheme, assistance is provided for the purchase of breeder seeds, production of foundation seeds, production and distribution of certified seeds, distribution of seed mini kits, distribution of plant protection equipments, weedicides, supply of rhizobium culture/phosphate solubilising bacteria, distribution of gypsum/ pyrite/ liming/dolomite, distribution of sprinkler sets and water-carrying pipes, publicity, etc. to encourage farmers to grow pulses on a large scale.

The number of seed mini kits supplied to the states are indicated below:

Number of Mini Kits allocated to States during 2006-07

	Oilseeds	Pulses	Total
Kharif 2006	4,23,650	3,08,334	7,31,984
Rabi 2006-07	9,33,010	4,39,660	13,72,670
Total	13,56,660	7,47,994	21,04,654

In order to disseminate information on improved production technologies among the farmers block demonstrations and Integrated Pest Management (IPM) demonstrations are organized through the State Department of Agriculture and frontline demonstrations through

the ICAR. The details of area coverage, production and yield of oilseeds and pulses during 2005-06 and 2006-07 are given as under:

Oilseeds

(Area: million ha; Prodn: million tonnes: Yield: kg/ha)

Kharif			Rabi			Total		
Area	Prodn	Yield	Area	Prodn	Yield	Area	Prodn	Yield
Year Year 2005-06*								
17.53	16.84	961	10.21	10.89	1067	27.74	27.73	1000
2006-07**								
	13.23							

* Fourth advance estimates as on 15 July 2006.

** First advance estimates as on 15 September 2006.

Pulses

(Area: million ha, Prodn; million tonnes; Yield: kg/ha)

Kharif			Rabi			Total		
Area	Prodn	Yield	Area	Prodn	Yield	Area	Prodn	Yield
Year 2005-06*								
10.63	4.66	439	11.80	8.45	716	22.43	13.11	585
2006-07**								
	4.97							

* Advance estimates as on 6 July 2005.

** Advance estimates as on 22 February 2006.

Oil Palm: - The oil palm development programme under ISOPOM has been approved to achieve an area expansion of 50,000 hectare, with an allocation of Rs. 50.00 crores during the Tenth Plan. The programme is being implemented in the states of Andhra Pradesh, Karnataka, Tamil Nadu, Gujarat, Goa, Orissa, Kerala, Tripura, Assam and Mizoram.

With a view to exploiting the huge potential of oil palm in India, an expert committee was constituted in November 2005. In its report, the committee has identified 10.36 lakh hectares as the potential area for oil-palm plantation and has recommended that 2.24 lakh hectares be brought under its cultivation in the Eleventh Five-Year Plan, with a total investment of Rs. 1175.00 crore. The year-wise target and achievement for the period 2005-06 and 2006-07 in respect of area coverage under oil palm through the implementation of the Oil-palm Development Programme is as follows:-

(Area in ha)

Year	Target	Achievement
2005-06	11,000	12665
2006-07	12,000	13818*
*Upto November 2006		

Maize: Maize is cultivated over an area of 77.27 lakh hectares with a grain production of 150.91 lakh tones (2005-06) annually in India. About 90 per cent of cultivated maize is Kharif rain-fed. Maize is cultivated mainly for food, fodder, feed and industrial use. More than 3500 value-added products of daily application are derived from maize. Under ISOPOM, maize development programmes are under implementation in 15 States viz. Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. The major achievements in area, production and productivity of maize for the period 2005-06 and 2006-07 are given as under:-

Year	**Area (lakh ha)**	**Production (lakh tonnes)**		**Productivity (kg/ha)**
		Targets	Achievements	
2005-06	77.27	141.00	150.91*	1953
2006-07	68-35	146.50	114.33**	1667
*Fourth advance estimate. **First advance estimates (Kharif only)				

Programmes in the North-Eastern States: Under ISOPOM, only oil-palm development programmes are being implemented in the states of Assam and Tripura. Since other North-Eastern states are not major producers of oilseeds, pulses and maize, they are not covered under ISOPOM. However, such states are permitted to undertake oilseeds, pulses and maize production programmes under the Macro Management Scheme.

Tree-Borne Oilseeds

A statutory and autonomous body under the Department of Agriculture and Cooperation, NOVOD has been assigned the task to promote the cultivation of tree-borne oilseeds including jatropha and Karanja. A central sector scheme, the 'Integrated Development of Tree-borne Oilseeds', during the Tenth Plan, is under implementation through the NOVOD Board to promote their cultivation. The Board has undertaken the following promotional activities:

- Development of elite planting material and model plantation in 10,000 hectares in 21 States.
- Research and development programmes through the national network of 43 institutions of the Indian Council of Agricultural Research (ICAR), Council of Scientific and Industrial Research (CSIR), Indian Council of Forestry Research and Education (ICFRE) and State Agriculture Universities (SAUs) etc., in 23 states.
- Transfer of technology by imparting training to the trainers and farmers on tree-borne oilseeds including jatropha and Karanja for bio-diesel production.
- Establishment of tree-borne oilseed gardens to demonstrate improved practices and IPM on tree-borne oilseeds.
- Back-ended Credit-linked Subsidy Programme (30 per cent subsidy, 50 per cent bank loan, 20 per cent beneficiary share) for commercial cultivation of jatropha and karanja, oil extraction and creation of pre-processing facilities for bio-diesel production.

Strategic Vision for Sustainable Growth In Agriculture

Although Indian Agriculture has come a long way, there are certain implications that have to be so addressed for national and

nutritional security. Our population is expected to be 1.4 billion by 2020. The increasing population, coupled with growing income will generate increased demand for food grains and non-food crops. Therefore, Indian agriculture has to achieve a higher growth rate targeted at 4 per cent per annum on a sustainable basis. Indian agriculture also has to diversify into high-value crops, raise productivity, restore soil health and enhance the application of modern technologies including biotechnology. The Department of Agriculture and Cooperation is working on strategies to achieve 4 per cent annual growth rate. These include focus on potential areas, regionally-differentiated strategies, crop diversification and the scientific management of natural resources.

Source: Ministry of Agriculture, Government of India, New Delhi

CHAPTER 5

INTEGRATED NUTRIENT MANAGEMENT

Some major initiatives that have been taken to promote the balanced and integrated use of fertilizers are enumerated below:-

The Government is promoting the soil test-based balanced and judicious use of chemical fertilizers, bio-fertilizers and locally available organic manures like farmyard manure, compost, nadep, compost, vermi compost, green manure and press mud etc., to maintain soil health and its productivity. The Centrally Sponsored Scheme on Balanced and Integrated Use of Fertilizers, since subsumed under the Macro Management of Agriculture Scheme, provides for the promotion of soil test-based application of chemical fertilizers, strengthening of soil testing facilities in the country and setting up of compost plants for conversion of biodegradable city waste into organic manure.

At present, there are 609 soil-testing laboratories in India. These include 487 static and 122 mobile laboratories under the State Governments and the fertilizer industry with an annual analyzing capacity of 6.7 million soil samples. Under the scheme, soil health cards are being issued by the State Government to the farmers for advising them on the use of correct and balanced use of fertilizers for maximum efficiency and profitability.

Quality Control

To ensure the adequate availability of fertilizers of a standard quality to farmers, fertilizers were declared as an essential commodity; and the Fertilizer Control Order (FCO), 1985, was promulgated under Section 3 of the ECA to regulate the trade, price quality and distribution of fertilizers in India. The FCO has been recently amended to make it more user-friendly and amenable to effective enforcement. For the fist time, bio-fertilizers and organic manures have also been brought under the regulatory mechanism. In Schedule III and IV of the FCO, the specifications of four important bio-fertilizers and three organic manures have been notified to ensure the adequate availability of fertilizers of standard quality to farmers.

The enforcement of this order has primarily been entrusted to the State Governments. The Central Government provides training

facilities and technical guidance to the states and supplements their efforts through random inspection of manufacturing units and their distribution network through inspectors. At present, there are 67 laboratories in India (including four Central Government laboratories) with a total annual fertilizer capacity of 1.22 lakh samples. The analytical capacity and the number of samples analysed and found to be non standard during the last five years are as under:

Year	No. of labs	Annual analytical capacity	No. of Samples analysed	% Non-standard samples
2001-02	65	119415	108425	58
2002-03	67	125480	109504	5.4
2003-04	67	124778	104647	5.5
2004-05	67	124730	108859	6.0
2005-06	67	122488	111745	6.0
2006-07 (upto 30 Sept. 2006)	67	122500	31749*	4.3

*Information awaited from some states.

The Central Fertilizer Quality Control & Training Institute (CFQC&TI), Faridabad: The major functions of the CFQC & TI and its three Regional Fertilizer Control Laboratories (RFCLs) located at Navi Mumbai, Chennai and Kalyani include drawal, inspection and analysis of both indigenous and imported fertilizers; training of state enforcement officers and analysis including officers from developing countries: development of methods of analysis; and acting as a referee laboratory and advisory body on the issues relating to fertilizer quality control. The activities undertaken are briefly indicated below:

The CFQC & TI and RFCLs analysed 14189 samples against the target of 8500 during 2005-06 (showing an achievement of 166.9 per cent over the target), out of which 402 samples were found to be non-standard. During 2006-07 (till 31 December 2006), a further 11004 samples were analysed, out of which 261 samples were found to be non-standard.

During 2005-06, 517 ships were inspected, out of which seven containers of 100 per cent water soluble NPK and one urea ship were found to be sub-standard. The Institute/RFCLs inspectors inspected 490 ships and containers of which six containers of NPK (100 per cent water soluble) were found to be non-standard in nutrient form during 2006-07 (up to 31 December 2006).

The Central teams, during a random inspection of manufacturing units and dealers' premises, collected 120 samples during 2005-06, of which 29.2 per cent samples were found to be non-standard. During 2006-07 (up to 31 December 2006), 87 samples were drawn, of which 35 per cent samples were found to be non-standard.

Training Programmes

During 2006-07 (up to 31 December 2006), 38 training programmes for fertilizer inspectors/ analysts were organized. In addition, an exclusive training programme for foreign participants (in which 20 officers from 15 countries participated) was held.

Training Programme for North-Eastern States: One refresher training course of two week's duration was organized in September 2006, exclusively for the benefit of enforcement officers of the North-Eastern states at RFCL, Kalyani. In addition, one two-day orientation training programme was organized in Assam in December 2006; and two dealers' programme were also organized.

National Seminar

The Institute organized a National Seminar on Fertilizer Quality Control on the 11 and 12 April 2005, at Faridabad. About 250 participants, mainly from the State Governments, ICAR, SAUs, the fertilizer industry, importers/ surveyors and fertilizer testing laboratories, attended the seminar.

National Project

This scheme was initiated as a pilot project in October 2004 for the production, promotion, certification and market development of organic farming in India, with an outlay of Rs. 57.05 crore. The

project was introduced by subsuming the existing infrastructure of the National Bio-fertilizer Development Centre, Ghaziabad, and its six regional centres, located at Hissar, Jabalpur, Bangalore, Nagpur, Bhubaneswar and Imphal.

During the period 2006-07 (up to 31 December 2006), funds were provided for conducting 78 programmes for capacity building; 10 programmes on certification and inspection: 27 programmes on production and quality control of organic inputs; 79 programmes for the benefit of field functionaries (extension officers); and 219 training courses for farmers. In addition, as a part of the project, 68 model organic farms; 1093 field demonstrations on organic inputs; and 145 field demonstrations on enriched biogas slurry were sanctioned. Also, during the year under report (till 31 October 2006), 1014 samples of different organic inputs were analysed of which 23 samples were found to be sub-standard.

Production & Consumption

India is the third largest producer and consumer of fertilizers in the world after China and the USA, and contributes about 11.4 and 11.9 per cent to the total world production/ consumption of NPK nutrients respectively. However, in terms of consumption per hectare, the consumption in India (104.5 kg. per hectare) is lower than neighbouring countries, showing scope for further increase.

The consumption of chemical fertilizers in India by and large was stagnant from 2001-2002 to 2003-04. However, it has increased during the last two years; consumption during 2005-06 was 203.40 lakh metric tonnes (LMT) of NPK nutrients which is the highest ever achieved. The consumption during the last few years is indicated below:-

Consumption of fertilizers (in lakh tonnes)

Year	Urea	DAP	MCP	N	P	K	N+P+K	Kg/ha
1999 to 2000	202.78	69.37	20.49	115.92	47.99	16.78	180.69	94.94
2000 to 2001	191.86	58.84	18.29	109.20	42.15	15.67	167.02	89.63
2001 to 2002	199.17	61.81	19.93	113.10	43.82	16.67	173.60	91.13
2002 to 2003	184.93	54.73	19.12	104.74	40.19	16.01	160.94	91.45
2003 to 2004	197.67	56.24	18.41	110.77	41.24	15.98	167.99	88.05
2004 to 2005	206.65	62.56	24.06	117.13	46.24	20.61	183.98	94.52
2005 to 2006	222.97	67.64	27.31	127.23	52.04	24.13	203.40	104.50

The consumption of fertilizers during Kharif 2006 is estimated to be 100.10 LMT of NPK nutrients, which constitutes an increase of approximately 9 per cent over Kharif 2005. The consumption during 2006-07 (both Kharif and Rabi) is likely to be more than 220 LMT. However, the fertilizer consumption in India is very skewed with wide inter-state, inter-district and inter- crop variations, though the NPK ratio, which is an indicator of the balanced use of chemical fertilizers, has improved to 5.3:2.2:1 during 2005-06, against 5.7:2.2:1 during the preceding year.

To ensure the adequate availability of fertilizers to farmers, the Department of Agriculture and Cooperation makes a demand assessment well in advance through half-yearly input zonal conferences in consultation with the State Governments and the fertilizer industry. Thereafter, the Essential Commodities Act (ECA), Supply Plan and orders are issued under the Fertilizer Movement Control Order for indigenous and imported urea by the Department of Fertilizers to ensure its timely availability.

Fertilizer Prices

All chemical fertilizers except urea continued to be decontrolled. The Government of India continues to provide a subsidy to the manufacturers of urea to ensure its availability to farmers at reasonable prices. Further, in order to make available decontrolled Phosphatic (P) and Potasssic (K) fertilizers at reasonable prices, the government has been implementing a scheme of concession on sales of these fertilizers. There was no increase in the price of major fertilizers and the prices of urea and other fertilizers remained at the same level as of 2003-04. The fertilizer prices during the year under report are as under:-

Sl.	Product	Rs. per tonne
1.	Urea	4830
2.	Di- Ammonium Phosphate (DAP)	9350
3.	Muriate of Potash (MOP)	4455
4.	Single Super Phosphate (SSP)	Prices fixed by the State Government vary from 2600-4612
5.	Complex Fertilizers	6980-9080

Buffer Stocking of P and K Fertilizers: To ensure the adequate availability of decontrolled fertilizers in remote and inaccessible areas, a buffer stock of limited quantities of DAP and MOP is being maintained at strategic locations to meet the emergent requirements of states.

Source: Ministry of Agriculture, Government of India, New Delhi.

CHAPTER 6

FARM MODERNIZATION & PROMOTION OF AGRO – INDUSTRIES

For the promotion of agricultural mechanisation, the strategy and programmes of the Department of Agriculture and Cooperation have been directed towards the promotion of eco-friendly and selective agricultural equipment. The aim is to optimally and efficiently utilize the different sources of human, animal and mechanical/electrical power, increasing productivity of land, labour, seeds, fertilizers, pesticides and irrigation water; improving the quality of the farm operations by promoting equipment having appropriate technology thereby reducing the cost of production and the drudgery associated with various agricultural operations. As a result of different programmes implemented by the Government of India over the years, the total farm power availability is estimated to have been increased from 0.295 kw/ha in 1971-72 to 1.502 kw/ha in 2005-06.

As a result of the joint efforts made by the Government and the private sector, the level of mechanisation has been increasing steadily over the years. This is evident from the sale of tractors and power tillers, taken as indicator of the adoption of the mechanized means of farming, during the last five years, as given in the Table below:-

(In Nos.)

Year	Tractors Sale	Power Tillers Sale
2000-01	254825	16018
2001-02	225280	13563
2002-03	173098	14613
2003-04	190336	15665
2004-05	247693	18985
2005-06	292908	22303
2006-07 (up to 31 December 2006)	263146	13375

(Provisional)

Training & Testing

The Farm Machinery Training & Testing Institutes (FMTTIs) located at Budni (Madhya Pradesh), Hissar (Haryana), Garladinne (Andhra Pradesh), and Biswanath Chariali (Assam), have been imparting training to farmers, technicians, retired/ retiring defence personnel etc., in the selection, operation, maintenance, energy conservation and management of agricultural equipments. These institutes have also been conducting testing and performance evaluation of various agricultural implements and machines. During the year 2006-07, 4159 persons were trained till 31 December 2006 against the annual target of 5000 in different courses. The target of training in the Tenth Plan was increased to 25,000 from 17,500 fixed during the Ninth Plan. To supplement the efforts of the MTTIs in human resource development, outsourcing of the training through the SAUs, agricultural engineering colleges, polytechnics, etc. had been approved during the Tenth Plan. For the training of farmers, the identified institutions are reimbursed Rs. 2500 per trainee per month, which also includes a stipend of Rs. 600 and to and from travel expenses by normal modes of transport. The target of training by outsourcing during the Tenth Plan is 10,000 persons. The physical target for 2006-07 is to train 3000 farmers. During 2006-07, Rs. 0.59 crore has been released for outsourcing components (30 December 2006). The feedback from the States indicates that the State Government of Chhattisgarh has trained 104 farmers through out-sourcing; Goa 80; Madhya Pradesh 167; Maharashtra 2884; Manipur 135; Orissa 20; Tamil Nadu 2554, and Tripura 49 farmers, during 2005-06.

The FMTTIs have continued to test farm machines and equipment. The Institute at Budni has been authorised to conduct tests on tractors, power- tillers and other agricultural machines; while the Institute at Hissar conducts tests on self-propelled combine harvesters, irrigation pumps, plant protection equipment, agricultural implements and other machines. The Institute at Garladinne has been authorised to test power- tillers and also conduct tests on various agricultural implements/ equipment components. This Institute is being developed as a speciality Institute for meeting the mechanization demand in rain-fed/ dryland farming systems. The Institute at Biswanath Chariali (Assam) tests bullock-drawn implements, manually operated equipment and small hand tools. For

the Tenth Plan, the target of testing was increased to 550 machines/ tools from 350 machines/ tools fixed during the Ninth Plan.

The four FMTTIs altogether have tested 82 machines of various categories, including tractors, power-tillers, combine harvesters, rice transplanters, reapers, rotavators and implements, till 31 December 2006, against the target of 110 for the year 2006-07.

Demonstrations

For enhancing production and productivity, as well as for reducing the cost of production, the induction of improved/ new technology in the agricultural production system is inescapable. Therefore, with this aspect in view, the demonstration of newly developed agricultural equipment including horticultural equipment at farmers' fields has been included as a component of the restructured scheme. This scheme envisages the conduct of demonstration of improved/newly developed agricultural/ horticultural equipment, identified by the State Governments/ Government Organisations at farmers' fields, to acquaint them about their use and utility for the production of different types of crops. During the year 2006-07, funds to the tune of Rs. 5.52 crore have been released to the State Governments of Chhattisgarh, Arunachal Pradesh, Haryana, Himachal Pradesh, Jammu and Kashmir, Manipur, Nagaland, Punjab, Orissa, Tamil Nadu, Uttar Pradesh, Sikkim and West Bengal (till 31st December 2006), for conducting the demonstration of new equipments, viz, seed-cum-fertilizer drill, strip-till-drill, raised bed planter, rotavator, reapers, etc. This includes an amount of Rs. 0.93 crore provided to ICAR during the year.

It has been reported by 13 State Governments and ICAR that 8698 demonstrations on different types of equipments covering about 12683 hectares with field machines, and 51099 hours on stationary machines were conducted during 2005-06, as against the annual target of 1000 demonstrations. Over 348200 farmers participated in these demonstrations. During the year 2006-07 (up to 31 December 2006), the number of demonstrations conducted is 962 covering 1079 hectares with field machines and 3658 hours with stationary machines in which over 47100 farmers participated.

Farm Mechanisation

Assistance in the form of subsidy at the rate of 25 per cent of the cost with permissible ceiling limits is made available to the farmers for the purchase of agricultural equipment including hand tools, bullock-drawn/ power-driven implements, planting, reaping, harvesting and threshing equipment, tractors, power-tillers and other specialized agricultural machines under the centrally sponsored scheme of Macro Management of Agriculture.

As per the feedback from the State Governments, 7292 tractors, 16500 power tillers, 64610 hand tools, 41854 bullock-drawn implements, 15236 tractor-driven implements, 6080 self-propelled/ power driven equipment, 81496 plant protection equipment, 6587 irrigation equipment, and 66464 gender-friendly equipment were supplied to the farmers under the Macro Management of Agriculture Scheme during 2005-06. During the year 2006-07 (up to 31 December 2006), 2782 tractors, 2990 power tillers, 34960 hand tools, 9649 bullock- drawn implements, 19393 tractor-driven implements, 631 self-propelled/ power-driven equipments, 18751 plant protection equipments, 1310 irrigation equipments and 9350 gender-friendly equipments have been supplied to the farmers.

Micro-Planning

The scheme envisages an in-depth study at the micro level, keeping in view technological, agro-economical, sociological and other relevant factors for formulating effective and balanced strategies for all-round development of agricultural mechanization, for each agro-climatic zone of India. The study was entrusted to the IASRI, New Delhi, under ICAR. The study report has since been received. Based on the findings and the recommendations contained in the report, the Government will formulate suitable strategies and programmes for the promotion of agricultural mechanization in different agro-climatic zones of India. In the meantime, the report has also been forwarded to all the State Governments/ UT Administrations and FMTTIs for implementation of such recommendations as can readily be put in operation.

Agro- Industries

The Government of India had advised the State Governments in the year 1964, to set up State Agro Industries Corporations (SAICs) in the public sector to act as catalysts in providing access to industrial inputs for farmers, for their use in agriculture. Thus, 17 SAICs were set up in the joint sector with equity participation of the Government of India and respective State Governments, namely Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Uttar Pradesh, Tamil Nadu and West Bengal from 1965 to 1970. Many of the State Governments have increased their equity participation as a result of which the Government of India, at present, is a minority shareholder. SAICs have since expanded their basic functions by commencing manufacture and marketing of agricultural inputs, implements, machines, after-sales services, promotion and development of agro-based units/ industries. The Government of India is implementing a policy of disinvestments of its shares in SAICs with a view to giving greater decision-making power to the state governments by allowing transfer of its shares to state governments on the following guidelines:

- Where the net worth of the SAIC is positive, the Government of India would be willing to consider offering the shares to the state Governments at a price 25 per cent less than the book value of the shares on the basis of the latest available audited balance sheet.

- In the case of SAICs whose net worth is negative, the Government of India would be willing to pass on its stake for a token consideration of Rs. 1000 for the value of the shares.

So far, the Government of India's shares in SAICs of Gujarat, Karnataka, Uttar Pradesh, Tamil Nadu, Rajasthan and West Bengal have been transferred to the State Governments concerned. The State Governments of Madhya Pradesh and Assam have since agreed, in principle, for the transfer of the Government of India's shares held in these SAICs.

Activities In The North – East

An FMTTI has been established at Biswanath Chariali in the Sonipur district of Assam, to cater to the needs of human resource development in the field of agricultural mechanization and also to assess the quality and performance characteristics of different agricultural implements and machines in the region. The Institute imparted training to 623 persons and tested seven machines up to 31 December 2006, during the year 2006-07.

During the year 2005-06, funds amounting to Rs. 1.27 cores were released to the State Governments of Arunachal Pradesh (Rs. 0.20 crore); Manipur (Rs. 0.17 crore), Mizoram (Rs. 0.15 crore); Sikkim (Rs. 0.50 crore); and Tripura (Rs. 0.25 crore), under the central sector scheme for the demonstration of new equipments. In addition Rs. 2.50 lakhs were released to Tripura for outsourcing of training of farmers during 2005-06. During 2006-07 funds have been released to Arunachal Pradesh (Rs. 0.39 crore), Manipur (Rs. 0.12 crore) and Nagaland (Rs. 0.39 crore) for demonstration components.

Source: Ministry of Agriculture, Government of India, New Delhi

CHAPTER 7

AGRICULTURAL EXTENSION PROGRAMMES

Public research and extension has played a major role in increasing production and productivity in agriculture and allied sectors in the past. The nature and scope of agricultural extension has undergone fundamental changes since then. Transferring research results on farmers' fields is an important challenge facing us today. The Department of Agriculture and Cooperation, GoI has taken several initiatives to revitalize the agriculture extension system in India. These initiatives include:

Agricultural Technology Management Agencies (ATMAs)

The scheme of supporting State Extension Programmes launched during 2005-06 aims at making extension systems farmer driven and farmer accountable by way of new institutional arrangements for technology dissemination in the form of ATMA (Agricultural Technology Management Agencies) at the district level to operationalize the extension reforms. ATMA will have the active participation of farmers/farmer groups, NGOs, KVKs, Panchayati Raj Institutions (PRIs) and other stakeholders operating at district level and below. The release of funds is based on State Extension Work Plans (SEWPs) prepared by the State Governments. It is proposed to cover 252 districts across all the states/UTs during the Tenth Plan.

The plethora of activities being supported under the scheme includes state-level activities viz. SAMETs, training and exposure visits of extension functionaries, state-level exhibitions, monitoring and evaluation, rewards and incentives, etc. The district-level activities include farmer-oriented activities (training, demonstration, exposure visit, group mobilisation and capacity building), information dissemination (exhibition, information technology and print media), research extension farmer linkages, etc. In order to ensure that key reforms under the scheme are adequately addressed, the following policy parameters are specified.

❖ Multi-agency extension strategies: Minimum 10 per cent of allocation on recurring activities at district level is to be used through non-governmental sector viz. NGOs, Farmers' Organisations (FOs),

PRIs, para-extension workers, agricultural entrepreneurs, input suppliers, the corporate sector, etc.

❖ Farming system approach: The activities specified are broad enough to promote an extension delivery consistent with a farming systems approach and extension needs emerging through a Strategic Research and Extension Plan (SREP).

❖ Farmer-centric extension services: It provides for group-based extension and it has necessary allocation for activities related to organizing and supporting farmer groups. In order to supplement these efforts, a provision for rewards and incentives to the best organised farmer groups has also been provided.

❖ Convergence: The SREP and SEWP would also be mechanisms for ensuring convergence of all activities for extension. At present, resources for extension activities are being provided under different schemes of the Central/State Governments. It is mandated that the SEWP to be submitted by the state Government for funding under the scheme shall explicitly specify the activities to be supported from the resources of other ongoing schemes as well as from this scheme.

❖ Mainstreaming gender concerns: It is mandated that a minimum 30 per cent of resources on programmes and activities are utilized for women farmers. Similarly, 30 per cent of resources meant for extension workers are to be utilized for women extension functionaries.

❖ Sustainability of extension services: It is mandated that a minimum contribution of 10 per cent should be realized from the beneficiaries with respect to the beneficiary-oriented activities.

The implementation status of these activities since May 2005, where these were launched, is briefly indicated below:

❖ 27 states and two UTs have already established ATMAs in 261 districts till January 2007.

❖ Over 1100 master trainers have been trained in 27 states.

❖ The SEWPs of 25 states were approved in 2005-06 and those of 20 states have been approved till 31 December 2006 during 2006-07.

❖ Over 421,000 farmers including 1.54 crore farm women (36 per cent) have benefited through the farmer-oriented extension activities viz. exposure visit, training, demonstration, kisan melas/gosthies up to 31 December 2006.

❖ As against BE of Rs. 50.00 crore, a sum of Rs. 30.57 crore has been released to the states upto 31 December 2006.

Gender Mainstreaming: The ATMA programme provides that a minimum of 30 per cent of available resources are to be utilized for women farmers. In order to provide necessary emphasis, the erstwhile Women Cell of the DCE has been restructured as the NGRCA. This centre is also mandated to perform functions of the Gender Budgeting Cell of DAC. The studies initiated by the NGRCA include:

❖ The development of a gender sensitisation module for programme implementers.

❖ The development of participatory material production and documentation of success stories of women farmers.

❖ The evaluation and impact assessment of central sector scheme, "Women in Agriculture".

❖ The assessment of incidence of benefits to women farmers under DAC schemes and its cost of delivery.

Mass Media Support

This is a central sector scheme launched in April 2005 in its current form. The existing infrastructure of DD and AIR is being utilised for the production and telecast of 30-minute agricultural programmes five or six days a week. Programmes are being produced by 36 narrowcasting centres (high/low power transmitters), 18 regional kendras and DD's national channel, as well as 96 FM stations

of AIR. Farmers' feedback is being collected regularly through the Audience Research Units(ARUs) and DD and AIR. State/district-level monitoring committees are mandated to guide and monitor implementation of the scheme at the respective levels.

Audio/video reports on emerging issues viz. Rabi/Kharif campaign, Kisan Cell Centres, Kisan Credit Card, MSPs, etc. are also publicised through these programmes using free commercial time. The scheme also has provisions for training, capacity building etc.

An amount of Rs. 104.22 crore has been released to Prasar Bharati up to 31 December 2006.

Agri-Clinic & Agri-Business Centres

This is a Central sector scheme which aims to promote the delivery of extension and other services in a self-employment mode. Graduates in agriculture and allied sectors are eligible under the scheme. The full cost of training in Agri-business development is supported. NABARD monitors the credit support to agri-clinics through commercial banks.

The provision of a credit-linked back-ended subsidy at the rate of 25 per cent of the capital cost of project funded through a bank loan, as well as full interest subsidy for the first two years on the bank credit, has recently been approved under the scheme. The subsidy would be 33.33 per cent in respect of candidates belonging to the scheduled castes, scheduled tribes, women and other disadvantaged sections and those from the North-Eastern and hill states.

Kisan Call Centres

This is a Central Sector Scheme launched with the objective to provide information on demand to the farming community through toll-free telephone lines throughout the country. These call centres operate from 6.00 am to 10.00 pm, seven days a week. Replies to farmers' queries are being given in 21 local languages. State-level monitoring committees are mandated to monitor implementation of the scheme at the state level. Since the launch of the scheme on 21

January, over 19.50 lakh calls have been received in the Kisan Call Centres. As against the BE of Rs. 6.75 crore for the current financial year, a sum of Rs. 2.21 crore has been released up to 31 December 2006.

AGRICULTURE SUMMIT: 2006: The Agriculture Summit 2006 on the theme 'Reforms for Empowering the Farmer', was organised by the Ministry of Agriculture jointly with FICCI at Vigyan Bhavan on 18-19 October 2006. It sought to accelerate and consolidate the process of change in the farm sector, while simultaneously creating awareness and better understanding of such a process. A large number of farmers from different states, representatives of private sector companies, Central and State Governments, scientists and others had participated in the Summit.

HRD Support

The DAC has strengthened a network of training institutions in the country by supporting MANAGE at Hyderabad; four regional EEIs at the regional level and SAMETIs at the state level.

❖ MANAGE: This institute provides training support to senior and middle-level functionaries of the State Governments. It also provides necessary support to the states in the implementation of the extension reforms (ATMA) scheme. Against 100 training courses planned, 78 training courses with 2030 participants have been organized by MANAGE up to 31 December 2006. Against the budget allocation of Rs. 4.70 crore, an amount of Rs. 3.29 crore has been released upto 31 December 2006.

The self-financing educational training courses viz. the two-year postgraduate programme in agri-business management, one-year postgraduate diploma in agri-warehousing and cold chain management, and one-year distance education diploma in agricultural extension services for input dealers are being continued during the year 2006-07 at MANAGE.

❖ EEIs: Four EEIS namely, Nilokheri (Haryana), Rajendranagar (Andhra Pradesh), Anand (Gujarat), and Jorhat (Assam), are operating at the regional level for training middle-level functionaries

working in agriculture and line departments in the States. During 2006-07, EEIs have conducted 85 courses with 1808 participants till 31 December 2006. Out of the budget allocation of Rs. 1.50 crore, an expenditure of Rs. 0.99 crore has been incurred till 31 December 2006.

❖ Model Training Courses: These courses, on thrust areas of agriculture, horticulture, animal husbandry, and fisheries etc. are supported by the DOE through SAUs, ICAR and other national institutes. During the current year, 12 training courses with 235 participants have been organized till the end of December 2006. Of an amount of Rs. 0.23 crore that was earmarked for the programme, Rs. 0.20 crore has been released till 31 December 2006.

Exhibitions/Fairs

The Department of Agriculture and Cooperation participated in the India International Trade Fair 2006 organized by Indian Trade Promotion Organisation (ITPO). In addition, the Krishi Expo was organized in February 2007. The DOE supported five regional exhibitions during 2006-07; one at Ludhiana (Punjab), held between 21.22 September 2006; and those at Samastipur (Bihar), Indore (MP), Trissur (Kerala); and Umain (Meghalaya) to be organised by SAUs/CAR institutes. The DOE participated in Agro-Tech at Chandigarh from 1-4 December 2006 and in the Kisan Exhibition at Pune from 13-17 December 2006. State and district-level fairs are supported under the ATMA programme.

National Productivity Awards

These awards seek to encourage productivity enhancement in the agriculture sector by various organizations and are given in 10 disciplines of agriculture, dairy development, fisheries, horticulture, etc. The awards are processed through the National Productivity Council.

Research-Extension Interface

A system of season-wise interface between the Department of Agriculture and Cooperation, the ICAR and the Department of Animal Husbandry, Dairying and Fisheries (DAHD&F) was initiated

during the pre-Kharif and pre-Rabi phases in January 1995. So far, 22 interfaces have been organized by the Department. The last interface in the series, i.e. the Pre-Rabi Interface 2006, was organized on 24 and 30 September 2006.

Distance Learning

A pilot initiative on capacity building through distance learning has been taken up in collaboration with the Indira Gandhi National Open University (IGNOU). It would provide information/knowledge to enrolled extension workers in both governmental and NGO sectors on value-added products from fruits and vegetables. During the year 2006-07, out of the earmarked funds of Rs. 20.00 lakhs, Rs. 19.68 lakhs have been released to IGNOU for this purpose.

Central Monitoring and Evaluation: The specific activities under this component include (I) central monitoring and evaluation of schemes by engaging institutions of repute; and (ii) outsourcing case studies on critical areas. The evaluation of the Kisan Call Centre scheme by ASCI, Hyderabad, has been completed. Evaluation of the mass media scheme and agri-clinic and agri-business centre schemes are under process.

Programmes for North-Eastern States

The details of the programmes under implementation in the North-Eastern states are as follows:

Agricultural Extension Programmes in the North-East

(Rs. in crore)

Sl.	Schemes/ Programme/ Activities Approved	Details of Scheme/ Programmes/ Activities	Target	Achievement	Budget Allocation	Utilisation/ Release
1.	Support to state Extension Programmes for Extension Reforms	Establishment of Agricultural Technology Management Agencies (ATMAs)	36	34	8.00	1.39

2.	Mass Media Support to Agricultural Extension	Number of Narrowcasting centres Number of Kisan Van Stations	21 10	21 10	20.00	12.84
3.	Establishment of Agri-Clinics and Agri-Business Centres by Agriculture Graduates	Training of agriculture graduates	All Graduates in Agri. & Allied sectors are eligible to apply	Assam-30 Manipur-23 Nagaland-3	1.00	Funds are yet to be released
4.	Kisan Call Centres	Receipt of calls from farmers.	All farmers have free access to KCCs through toll free telephone lines	Number of calls received during the Arunachal Pradesh (56) Assam (5705) Manipur (2524) Meghalaya (1214) Mizoram (1182) Nagaland (230), Sikkim (75) and Tripura (1638)	The funds are released to TCIL centrally	
5.	Extension Education Institutes (EEIs), Jorhat	Training of middle level functionaries	25 Courses	13 courses (347 participants)	0.25	0.063

Source: ***Ministry of Agriculture, Government of India, New Delhi.***

CHAPTER 8

AGRICULTURAL CREDIT POLICY

The Agricultural Credit Policy essentially lays emphasis on augmenting credit flow at the ground level through credit planning, adoption of region-specific strategies, rationalization of lending policies and procedures and bringing down the cost of borrowing. Bank credit is available to the farmers in the form of short-term credit for financing crop production programmes and in the form of medium-term/long-term credit for financing capital investment in agriculture and allied activities like land development including purchase of land, minor irrigation, farm mechanization, dairy development, poultry, animal husbandry, fisheries, plantation and horticulture. Loans are also available for storage, processing and marketing of agricultural produce.

Institutional Arrangements

Agricultural credit is disbursed through a multi-agency network consisting of Commercial Banks (CBs), Regional Rural Banks (RRBs) and Cooperatives. There are approximately 100,000 village-level Primary Agricultural Credit Societies (PACS), 368 District Central Cooperative Banks (DCCBs) with 12,858 branches and 30 State Cooperative Banks (SCBs) with 953 branches providing primarily short and medium-term agricultural credit in India. The long-term cooperative structure consists of 19 State Cooperative Agricultural and Rural Development Banks (SCARDBs), with 2609 operational units as on 31 March 2005, comprising 788 branches and 772 Primary Agricultural and Rural Development Banks (PA&RDBs) with 1049 branches.

Credit Flow

A comprehensive credit policy was announced by the Government of India on 18 June 2004, containing measures for doubling agriculture credit flow in the next three years and providing debt relief to farmers affected by natural calamities. The following are the highlights of this announcement:

❖ Credit flow to agriculture sector to increase at the rate of 30 per cent per year.

❖ Debt restructuring in respect of farmers in distress and farmers in arrears providing for the rescheduling of outstanding loans over a period of five years including moratorium of two years, thereby making all farmers eligible for fresh credit.

❖ Special One-Time Settlement scheme for old and chronic loan accounts of small and marginal farmers.

❖ Banks allowed extending financial assistance for redeeming the loans taken by farmers from private money lenders.

❖ Commercial Banks (CBs) to finance at the rate of 100 farmers/branch; 50 lakh new farmers to be financed by the banks in a year.

❖ New investments in agriculture and allied activities at the rate of two to three projects per branch.

❖ Refinements in Kisan Credit Cards (KCCs) and fixation of scale of finance.

The achievements in terms of credit flow during the year 2005-06 are listed below:

❖ The target of agriculture credit flow for the year 2005-06 was fixed at Rs. 141000.00 crore and the achievement as on 31st March 2006 was Rs. 167775.00 crore, representing 119 per cent of the target.

❖ Around 42.01 lakh new farmers were financed by the public sector CBs and 5.26 lakh new farmers by private sector CBs. Further, RRBs have financed 17.03 lakh new farmers during the year. The total number of new farmers financed by CBs and RRBs together formed 64.30 lakh, which is 128.60 per cent of the target set for the year.

❖ An amount of Rs. 4393.81 crore was provided as debt relief to farmers in distress, farmers in arrears and under the One-Time Settlement scheme during 2005-06.

❖ Public Sector CBs provided Rs. 22.14 crore as advances to 5173 farmers to enable them to redeem their debt from moneylenders. The corresponding figures for Cooperative Banks and

RRBs are Rs. 2.22 crores (283 loan accounts), and Rs. 7.05 crore (2826 loan accounts) respectively.

During the current year (as on 31 December 2006), the achievements with regard to credit flow are as follows:

- The target of agriculture credit flow for the year 2006-07 was fixed at Rs. 175000.00 crore and the achievement as on 31 December 2006 was Rs. 149343.16 crore, constituting 85.34 per cent of the target.

- During the first nine months of 2006-07, 34.92 lakh new farmers were financed by public sector CBs and 4.23 lakh new farmers by private sector CBs. Further RRBs have financed 14.22 lakh new farmers during the year. Thus, the total number of new farmers financed by CBs and RRBs together aggregated to 55.37 lakh, which exceeds the target of 50 lakh farmers for the year. In addition to this, cooperative banks financed 9.66 lakh new farmers during the year, taking the total number of new farmers financed by the banking system to 63.03 lakh.

- An amount of Rs. 4158.30 crore has been provided as debt relief to farmers in distress, farmers in arrears and under the One-Time Settlement scheme upto 31st. December 2006.

- Public sector CBs provided Rs. 36.25 crore as advances to 8722 farmers to enable them to redeem their debts from moneylenders. The corresponding figures for cooperative banks and RRBs are Rs. 10.76 crore (7311 loan accounts) and Rs. 17.06 crore (3548 loan accounts) respectively.

Restructuring Cooperative Credit

In August 2004, the Government of India constituted a task force under the chairmanship of Professor A. Vaidyanathan for suggesting measures for the revival of cooperative credit institutions. The task force submitted its report in respect of a short-term cooperative credit structure and recommended a financial package of Rs. 14839.00 crore for rural credit co-operative institutions. Based on the consensus arrived at with the State Governments and other stakeholders on the recommendations made by the task force, the Central Government approved the revival package that involves

financial assistance of Rs. 135.96.00 crore. NABARD has been designated as the implementing agency for the revival of the short-term co-operative credit scheme. A Department for Cooperative Revival and Reforms has been set up at the head office of NABARD for facilitating the implementation process. For guiding and monitoring the implementation of the revival package, a National - Level Implementing and Monitoring Committee (NIMC) has been set up under the chairmanship of the Governor of the RBI. The provision of financial assistance under the package has been linked to reforms in the cooperative sector. In order to avail financial assistance under the package, the State Governments are required to sign an MoU with NABARD, committing themselves to implement the legal, institutional and other reforms as envisaged in the revival package. So far, eight State Governments, namely, Andhra Pradesh, Maharashtra, Gujarat, Rajasthan, Orissa, Madhya Pradesh, Uttar Pradesh and Uttarakhand have signed MoUs with the Government of India, and four other State Governments, namely, Punjab, Bihar, Tamil Nadu and Sikkim, have conveyed their consent for participation in the revival package. The same task force has also submitted its report for the revival of the long-term cooperative credit structure.

Credit Cards

The KCC which was introduced in August 1998 for short- and medium-term loans to provide adequate and timely credit support from the banking system in a flexible and cost-effective manner covers 644.65 lakh farmers throughout India as on 30 December 2006. The scheme has been extended with effect from 31 October 2006 for all kinds of loan requirements of borrowers of the SCARDBs under the KCC, viz, short-medium-and long-term and a reasonable component of consumption credit within the overall limit sanctioned to the borrowers.

Rate of Interest

In the Union Budget for the year 2006-07, it was announced that effective from Kharif 2006-07, farmers would receive crop loans up to a principal amount of Rs. 3.00 lakh at 7 per cent rate of interest and that the Government of India would provide the necessary interest subvention to NABARD for this purpose. Further, in order to provide relief to the farmers who have availed of crop loans from CBs, RRBs and PACSs for Kharif and Rabi 2005-06, an amount equal

to two percentage points of the borrower's interest liability on a principal amount up to Rs. 1.00 lakh has been credited to their bank account before 31 March 2006. The Government has provided a sum of Rs. 1700.00 crore for this purpose in the Union Budget for the year 2006-07.

Package for Distressed Farmers

The Government of India has approved a rehabilitation package of Rs. 16978.69 crore for 31 suicide-prone districts in the states of Andhra Pradesh, Maharashtra, Karnataka and Kerala. The package which will be implemented over a period of 3 years includes both immediate and medium-term measures. The rehabilitation package aims at establishing a sustainable and viable farming and livelihood support system through debt relief to farmers, improved supply of institutional credit, a crop-centric approach to agriculture, assured irrigation facilities, watershed management, better extension and farming support services, and subsidiary income opportunities through horticulture, livestock, dairying, fisheries, etc.

Procedural Reform

The RBI issued instructions to banks to waive margin/ security requirements for agricultural loans up to Rs. 50,000. The introduction of the KCC scheme has also facilitated the extension of easy credit to the farmers. As the card is valid for three years, the farmers have been freed from routine documentation every year. The scope of the KCC has been expanded to include credit for investment purposes, as well as an element of consumption loan.

Natural Calamities

The RBI has issued standing guidelines to banks for providing relief to farmers in areas affected by natural calamities. These guidelines have been issued to enable banks to take uniform and concerted action expeditiously, and particularly to provide financial assistance to farmers affected by natural calamities.

National Agricultural Insurance Scheme

This scheme, with increased coverage of farmers, crops and risk commitment, was introduced in India from Rabi 1999-2000, replacing the erstwhile Comprehensive Crop Insurance Scheme

(CCIS). The main objective of the scheme is to protect farmers against crop losses suffered on account of natural calamities, such as drought, flood, hailstorm, cyclone, pests and diseases. The scheme is being implemented by the Agriculture Insurance Company of India Ltd. (AICL).

The scheme is available to all farmers-both loanees and non-loanees, irrespective of their size of holding. It envisages coverage of all food crops (cereals, millets and pulses), oilseeds and annual commercial/ horticultural crops, in respect of which past yield data is available for adequate number of years. Among the annual commercial/ horticultural crops, sugarcane, potato, cotton, ginger, onion, turmeric, chillies, pineapple, annual banana, jute, tapioca, coriander, cumin and garlic, have already been covered under the scheme. All other annual commercial/ horticultural crops are stipulated to be insured in due course of time, subject to the availability of past yield data. The scheme is operating on the basis of 'area approach', i.e. defined areas for each notified crop.

The premium rates are 3.5 per cent (of sum insured) for bajra and oilseeds; 2.5 per cent for other Kharif crops; 1.5 per cent for wheat, and 2 per cent for other Rabi crops. In the case of commercial/ horticultural crops, actuarial rates are being charged. Small and marginal farmers are entitled to a subsidy of 50 per cent of the premium charged from them, which will be shared 50:50 by the Central and State Governments. The premium subsidy will be phased out over a period of five years. During 2006-07, a 10 per cent subsidy on the premium is available to small and marginal farmers.

The scheme is optional for the states/ UTs. At present, the scheme is being implemented by the following 23 states and two UTs.

1. Andhra Pradesh	2. Assam	3. Bihar
4. Goa	5. Gujarat	6. Himachal Pradesh
7. Karnataka	8. Kerala	9. Maharashtra
10. Madhya Pradesh	11. Meghalaya	12. Tamil Nadu
13. Uttar Pradesh	14. West Bengal	15. Sikkim
16. Chhattisgarh	17. Jharkhand	18. Tripura
19. Orissa	20. Jammu & Kashmir	21. Uttarakhand
22. Haryana	23. Rajasthan	24. Pondicherry
25. Andaman And Nicobar		

Details of farmers covered, area covered, and sum insured and insurance charged under the NAIS during the last 14 crop seasons (i.e. from Rabi 1999-2000 to Kharif 2006) is given as under:-

NAIS Coverage

*(Rs. in crore)

Sl.	Sessions	Farmers Covered	Area (in hect.)	Sum Insured*	Premium*	Total Claims*
1.	Rabi 1999-2000	579940	780569	356.41	5.42	769
2.	Kharif 2000	8409374	13219829	6903.38	206.74	1222.48
3.	Rabi 2000-01	2091733	3111423	1602.68	27.89	59.49
4.	Kharif 2001	8696587	12887710	7502.46	261.62	493.54
5.	Rabi 2001-02	1955431	3145873	1497.51	30.15	64.66
6.	Kharif 2002	9768711	1553248	9431.69	325.47	1824.31
7.	Rabi 2002-03	2326811	4037824	1837.55	38.50	188.55
8.	Kharif 2003	7970830	12355514	8114.13	283.33	649.88
9.	Rabi 2003-04	4421287	6468663	3049.49	64.06	490.67
10.	Kharif 2004	12687046	24273242	13170.49	458.94	1037.64
11.	Rabi 2004-05	3531045	5343244	3774.21	75.85	160.59
12.	Kharif 2005	12673420	20530607	13517.73	449.88	1054.76
13.	Rabi 2005-06**	4045335	7216771	5069.45	104.78	252.29
14.	Kharif 2006**	6646649	10105442	7500.27	233.16	Not Available
	Total	85804199	139009060	83327.45	2565.69	7506.54
** Provisional						

The outlay for the Tenth Plan was fixed at Rs. 1500.00 crore against which Rs. 1992.47 crore was utilized during the first four years of the Tenth Five-Year Plan, i.e. up to 31 March 2006. Out of the budget provision of Rs. 500.00 crore (including Rs. 1.00 crore for

NER for the year 2006-07, Rs. 499.00 crore has been utilized upto 31 December 2006. No state-wise allocation is made under the scheme.

Review of NAIS

Over a period of the implementation of the NAIS, certain limitations/ shortcomings relating to unit area of insurance, calculation of guaranteed income, low indemnity level, delay in settlement of insurance claims etc. have been observed. Keeping in view the limitations in the existing scheme, a joint group was constituted to study the improvements required in the existing crop insurance schemes. The group made an in-depth study of the related issues and submitted its report, following which the report was circulated among the states/ UTs and various other quarters for comments/views. Most of the states/ UTs have agreed to the suggestions given by the joint group. Based on the recommendations of the joint group and comments received from various states/ UTs and other concerned organizations, a review of the NAIS is under the consideration of the Government of India. The proposed modified scheme with improvement features; likely to be implemented from the year 2007-08, will provide an effective risk mitigation mechanism to the farming community in the form of effective crop insurance solutions.

Central Assistance

In order to strengthen the cooperative credit structure for meeting the credit requirement of the farmers, central assistance is released to the State Governments under the scheme viz. investment in debentures of SLDBs. Under the NAIS, the Government of India releases the central share towards the payment of indemnity claims, premium subsidy, operational expenses, etc. to the AICL. The central assistance earmarked for the year 2006-07 and expenditure incurred up to 31 December 2006 under the above schemes are as under:

(Rs. in crore)

Sl.	Name of the Scheme	Budget Estimates	Expenditure Up to 31 December 2006
1.	Investment in Debentures of SLDBs including NER	50.00	45.00
2.	NAIS including NER	500.00	499.00

Implementation of NAIS in the North-Eastern States: At present NAIS is being implemented in four of the seven North-Eastern States, namely, Assam, Meghalaya, Sikkim and Tripura. The progress of the implementation of the scheme upto Kharif 2006, in these four States, is given as under.

Nais In The North-East

(Rs. in crores)

Particulars	Assam	Meghalaya	Sikkim	Tripura
Participated From	Rabi 1999-2000	Kharif 2000	Kharif 2001	Rabi-2001-02
Farmers Covered	71693	10883	1370	6905
Area Covered (in Ha.)	54205.12	12768.61	802.53	4168.08
Sum Insured	61.70	10.03	1.35	6.91
Premium	1.53	0.63	0.01	0.20
Subsidy	0.25	0.17	0.003	0.03
Total Claims	2.52	0.29	0.01	0.47
Farmers Benefited	12856	1169	86	2591

Source: Ministry of Agriculture, Government of India, New Delhi

CHAPTER 9
AGRICULTURAL MARKETING: CONSTRAINTS & REFORMS

In India, the organized marketing of agricultural commodities has been promoted through a network of regulated markets. Most of the State governments and UT Administrations have enacted legislations to provide for the regulation of agricultural produce markets. While by the end of 1950, there were 286 regulated markets in the country, their number as on 31 March 2006 stood at 7566. In addition, India has 21780 rural periodical markets, about 15 per cent of which function under the ambit of regulation. The advent of regulated markets has helped in mitigating the market handicaps of producers/ sellers at the wholesale assembling level. But the rural periodic markets in general and the tribal markets in particular, remained out of its developmental ambit.

Constraints

The purpose of State regulation of agricultural markets was to protect farmers from the exploitation of intermediaries and traders and also to ensure better prices and timely payment for their produce. Over a period of time, these markets have, however, acquired the status of restrictive and monopolistic markets, providing no help in direct and free marketing, organized relating and smooth raw material supplies to agro-industries. Exporters, processors and retail chain operators cannot procure directly from the farmers as the produce is required to be channelized through regulated markets and licensed traders. There is, in the process, an enormous increase in the cost of marketing and farmers end up getting a low price for their produce. Monopolistic practices and modalities of the State-controlled markets have prevented investment in the sector. Post-harvest losses are estimated to be of the order of 5-7 per cent in food grains and 25-30 per cent in the case of fruits and vegetables.

Market Reforms

The agriculture sector needs well functioning markets to drive growth, employment and economic prosperity in rural areas of India. In order to provide dynamism and efficiency into the marketing system, large investments are required for the development of post-harvest and cold-chain infrastructure nearer to the farmers' field. A

major portion of this investment is expected from the private sector, for which an appropriate regulatory and policy environment is necessary. Also, enabling policies need to be put in place to encourage the procurement of agricultural commodities directly from farmers' field and to establish effective linkage between the farm production and the retail chain and food processing industries. Accordingly, the State Governments were requested to suitably amend their respective APMC Acts for the deregulation of the marketing system in India, to promote investment in marketing infrastructure, thereby motivating the corporate sector to undertake direct marketing and to facilitate a national integrated market.

The Department of Agriculture and Cooperation also formulated a model law on agricultural marketing for guidance and adoption by the State Governments. The model legislation provides for the establishment of Private Markets/Yards, Direct Purchase Centres, Consumer/ Farmers' Markets for direct sale and promotion of Public-Private Partnership (PPP) in the management and development of agricultural markets in India. Provision has also been made in the Act for the constitution of State Agricultural Produce Marketing Standards Bureau for the promotion of Grading, Standardization and Quality Certification of agricultural produce. This would facilitate pledge financing, direct purchasing, forward/ future trading and exports. Several State Governments have initiated steps for amending their respective APMC Acts. A table indicating the State-wise status of reforms in APMC Acts as on 31 December 2006 is given below:

Sl.	Stage of Reforms	States/ UTs
1.	States/ UTs where APMC Acts have been suitably amended	Madhya Pradesh, Himachal Pradesh, Punjab, Sikkim, Nagaland, Andhra Pradesh, Chhattisgarh, Rajasthan, Orissa, Arunachal Pradesh, Maharashtra and Chandigarh
2.	States/ UTs where reforms to APMC Acts have been partially modified (a) By amending APMC Act/ Resolution (b) By Executive Order	Haryana, Karnataka, Gujarat and National Capital Territory of Delhi Uttar Pradesh

3.	States/ UTs where there is no APMC Act in operation	Bihar, Kerala, Manipur, Andaman & Nicobar Islands, Dadra & Nagar Haveli, Daman & Diu and Lakshadweep
4.	States/ UTs where APMC Act already provides for the reforms	Tamil Nadu
5.	States/ UTs where administrative action has been initiated for introducing the reforms	Assam, Mizoram, Tripura, Meghalaya, J&K, Uttarakhand, Goa, West Bengal, Pondicherry and Jharkhand

Terminal Markets

The Department of Agriculture, Government of India, has recently taken the initiative to promote modern terminal markets for fruits, vegetables and other perishables in important urban centres in India. These markets would provide state-of-the-art infrastructure facilities for electronic auction, cold chain and logistics and operate through primary collection centres conveniently located in producing areas to allow easy access to farmers. The terminal markets are envisaged to operate on a 'Hub-and-Spoke' format, wherein the Terminal Market (the hub) would be linked to a number of collection centres (the spokes).

The terminal markets would be built, owned and operated by a corporate/ private/ cooperative entity, either by itself, or through the adoption of an outsourcing model. The enterprise could be a consortium of entrepreneurs from agri-business, cold chain, logistics, warehousing, agri-infrastructure and/ or related background. The enterprise would charge a user charge for the services provided. The total financial outlay for the implementation of the above component during the Tenth Five Year Plan Period is Rs. 150 crores. The proposed expenditure will be met from the budget outlay of the National Horticulture Mission. The operational guidelines of the scheme have been circulated to the State Governments, which have amended their respective APMC Acts to allow the setting up of markets in the private sector.

Marketing Organizations

The Department of Agriculture and Cooperation has three organizations dealing with marketing under its administrative control, namely, the Directorate of Marketing and Inspection (DMI), Faridabad; the

Ch. Charan Singh National Institute of Agricultural Marketing (NIAM), Jaipur and the Small Farmers Agri-Business Consortium (SFAC), New Delhi.

The DMI is an attached office of the Department and is headed by the Agricultural Marketing Adviser. Its Head Office is at Faridabad (Haryana), and Branch Head Office as well as 11 Regional Offices and the Central Agmark Laboratory are located at Nagpur (Maharashtra). Besides these, there are 26 Sub-Offices and 16 Regional Agmark Laboratories (RALs) spread all over India as per the details given in the table below:

Regional Offices	Sub-Office under Regional Office	Agmark Laboratories under Regional Office
1. Delhi	1. Dehradun	1. Okhla 2. Ghaziabad
2. Kolkata	1. Patna 2. Bhubaneswar 3. Ranchi	1. Kolkata 2. Patna 3. Bhubaneswar
3. Mumbai	1. Nasik 2. Ahmedabad 3. Rajkot 4. Surat 5. Panaji 6. Pune 7. Sangli	1. Mumbai 2. Rajkot
4. Bhopal	1. Rajpur	1. Bhopal
5. Chennai	1. Bangalore 2. Madurai 3. Hubli	1. Chennai 2. Bangalore
6. Kochi	1. Calicut 2. Thiruvananthapuram	1. Kochi
7. Hyderabad	1. Guntur 2. Vishakhapattanam	1. Guntur
8. Guwahati	1. Shillong	1. Guwahati
9. Lucknow	1. Kanpur 2. Varanasi	1. Kanpur
10. Jaipur		1. Jaipur
11. Chandigarh	1. Jammu 2. Amritsar 3. Abohar 4. Shimla	1. Amritsar

The main functions of the Directorate are as follows:

❖ Rendering advice on statutory regulation, development and management of agricultural produce markets to the States/UTs;

- Promotion of Standardization and Grading of agricultural and allied produce under the Agricultural Produce (Grading and Marking) Act, 1937;
- Market Research, Surveys and Planning;
- Training of personnel in Agricultural Marketing;
- Marketing Extension;
- Agricultural Marketing Information Network;
- Construction of Rural Godowns and
- Development of Agricultural Marketing Infrastructure.

Grading and Standardization: The Agricultural Produce (Grading and Marking) Act, 1937 empowers the Government to fix quality standards, known as 'AGMARK' standards, and to prescribe terms and conditions for using the seal of AGMARK. So far, grade standards have been notified for 181 agricultural and allied commodities. The purity standards under the provision of the PFA Act and the Bureau of Indian Standards (BIS) Act, 1986 are invariably taken into consideration while framing the grade standards. International Standards framed by Codex/ International Standards Organization (ISO) are also considered so that Indian produce can compete in the international market.

During the year 2006-07, the following rules have been prepared and are in the process of being notified: (i) the Fruits and Vegetables Grading and Marking (Amendment) Rules, 2006, containing grade standards for capsicum, okra, strawberry, cherries, chillies, melons, watermelons, sapota, custard apple, cauliflower, beans, gherkins, carrots and pears; (ii) the Tapioca, Sago Grading and Marking Rules, 2006; and (iii) the Sattu Grading and Marking Rules, 2006. The grading standards of honey, cut flowers, cereals, oilseeds, tamarinds, mahua flowers, etc. are also under preparation. Four commodities identified by the Tribal Cooperative Marketing Development Federation (TRIFED), namely, jatropha seeds, myrobalans, karanja seeds and puwad seeds have been taken up for analysis as a part of a collaboration effort between TRIFED and DMI.

As a result of special efforts initiated to promote grading under AGMARK, commodities valued at Rs. 153.31 crores were graded for export purposes during the year 2005-06. During 2006-07

(upto 30 November 2006), commodities valued at Rs. 65.00 crores were graded. By the end of March 2006, 192 certificates of authorization holders were operating for grading of agricultural and allied produce for exports purposes under AGMARK. During 2005-06, commodities worth Rs. 4998.85 crores were graded for internal trade. During 2006-07 (upto 31 November 2006), commodities valued at Rs. 2800.00 crores (estimated) were graded for internal trade. There were also 5958 authorized packers that were operating for grading agricultural commodities for internal trade. During 2005-06, total revenue of Rs. 10.01 crores was realised on account of grading charges etc. During 2006-07 (upto 31 October 2006), an amount of Rs. 6.00 crores (provisional) has been realised.

Marketing Extension

AGMARK quality control programmes as well as improvements in marketing practices and procedures are given wide publicity through mass media. The information is disseminated through documentaries, cinema slides, printed literature, exhibitions, conferences, seminars and workshops. Agricultural Marketing, a quarterly bilingual journal, is also published regularly.

The Directorate participated in the India International Trade Fair, 2006, and will also participate in AHARA-2007. As a part of its normal activity, the Directorate through its regional/ sub-offices participated in 11 exhibitions arranged by other organizations at different places during 2005-06. On the eve of the World Consumers' Day, the Directorate organized symposia and mini exhibitions on AGMARK at 14 places. One exclusive AGMARK exhibition was organized at Ernakulum in Kerala during January 2007. Another was organized in Haryana.

Marketing Research and Information Network (AGMARKNET) is a central sector scheme that was launched by the Department of Agriculture and Cooperation, Government of India in March 2000. The scheme aims at progressively linking important agricultural produce markets spread all over India and the State Agriculture Marketing Boards/ Directorates and the DMI for effective exchange of market information. The market information network, AGMARKNET (agmarknet.nic.in), is being implemented jointly by DMI and NIC, using NICNET facilities available throughout the country. The

objective of the scheme is to facilitate collection and dissemination of information for better price realization. The scheme provides funds to the State and national level institutions managing the markets and executing market-led extension activities and thus, has no separate gender-specific provisions under the scheme. The portal covers market, price, infrastructure and promotion-related information for efficient marketing.

During the Tenth Plan, an outlay of Rs. 35 crores has been approved for the implementation of the scheme. This includes networking of markets, development of regional portals, market-led extension activities and development of market atlas on Global Information Systems (GIS) platform, etc. During 2006-07 (31 December 2006), as against a budgetary provision of Rs. 3.55 crores, an amount of Rs. 1.44 crores has been released to the NIC for computer connectivity for 121 nodes, and Rs. 18 crores to Madhya Pradesh and Karnataka for market-led extension activities.

The markets are reporting daily prices and arrivals data using a comprehensive national-level database at Agmarknet Portal (www.agmarknet.nic.in). Information on wholesale prices and arrivals in respect of 300 plus commodities and 2000 varieties are being disseminated through the portal on a daily basis. More than 1900 markets have been linked to the Central Agmarknet Portal and more than 1500 markets reported data during the month of November 2006. Weekly prices and arrivals trends are also being disseminated using the portal. Monthly prices and arrivals bulletins are being generated using the national database. In addition to price, other market-related information is provided through the portal. These relate to accepted standards of grades, labeling, sanitary and phyto-sanitary requirement, physical infrastructure of storage and warehousing, marketing laws, fees payable, etc. Similarly commodity profiles are being loaded on the portal. Commodities already covered include paddy/ rice, wheat, Bengal gram, black gram, red gram, mustard/ rapeseed, groundnut, soyabean and sunflower.

Further, the portal provides information about the schemes of DMI, weather information, e-directory of markets, CODEX standards, etc. The portal is also constantly being enriched. Information on

prices and arrivals is being disseminated in nine languages. The database developed under Agmarknet is also serving various commodity directorates of the Department of Agriculture and Cooperation by providing customized hyperlinks to data pertaining to specific commodities. An arrangement has been worked out with Indian Farmers- Fertilizer Cooperative Limited (IFFCO) for regular transmission of prices and arrivals data from Agmarknet to the touch screen multimedia kiosks being installed by them at the rural cooperative societies.

Rural Godowns

The Department of Agriculture and Cooperation introduced a central sector scheme, the 'Grameen Bhandaran Yojana', in March 2002 to promote the construction of rural godowns. The main objectives of the scheme include the creation of a scientific storage capacity with allied facilities in rural areas to meet the requirements of farmers for storing farm produce and to prevent distress sale of produce. Initially, the scheme was approved for two years i.e. upto 2003. The scheme was later approved for implementation upto 31 March 2007 with some modifications. Under the revised scheme, a subsidy at the rate of 25 per cent was given to all categories of farmers, agriculture graduates, cooperatives and the Central Warehousing Corporation/ State Warehousing Corporations (CWC/ SWCs). All other categories of individuals, companies and corporations are entitled to a subsidy at the rate of 15 per cent of the project cost. In the North-Eastern States/ hilly areas and SC/ ST entrepreneurs and their cooperatives, subsidy is provided at the rate of 33.33 per cent.

A total of 90 lakh tonnes capacity of rural godowns was targeted during the Tenth Plan period. However, the target has now been revised upwards to 140 lakh tonnes as the target of 90 lakh tonnes was achieved during 2004-05 themselves. Till 31 December 2006, 13030 storage projects having a capacity of 180.88 lakh tonnes have been sanctioned under the scheme.

Infrastructure, Grading and Standardization

The scheme for the development/ strengthening of agricultural marketing infrastructure, grading and standardization was launched on 20 October 2004. Under this scheme, a credit-linked

investment subsidy is being provided on the capital cost of general or commodity-specific marketing infrastructure for agricultural commodities and for the strengthening and modernization of the existing agricultural wholesale markets and rural or periodic markets in tribal areas. The scheme covers all agricultural and allied sectors including dairy, poultry, fishery, livestock and minor forest produce. The scheme is reform linked and is being implemented in those States/ UTs that permit the setting up of agricultural markets in the private and cooperative sector and allow direct marketing and contract farming.

A sum of Rs. 67.00 crores has been allocated for the implementation of the scheme during 2006-07, of which an amount of Rs. 25.00 crores has been provided to NABARD during the current year upto 30 November 2006. During this year, Bihar, Chhattisgarh, Arunachal Pradesh, Orissa, Maharashtra and the UTs of Chandigarh and Lakshadweep were notified for the implementation of the scheme. These are in addition to the States of Madhya Pradesh, Kerala, Manipur, Tamil Nadu, Sikkim, Nagaland, Himachal Pradesh, Punjab, Andhra Pradesh, Rajasthan, and the UTs of Andaman and Nicobar Islands, Daman and Diu and Dadra and Nagar Haveli which were notified in the previous year. There were 22 training and awareness programmes that were conducted. The operational guidelines of the scheme have been modified to permit the State agencies to take up projects from their own funds without availing credit from the financial institutions. The condition of altitude of location of the project has been relaxed and all projects in the States of Uttarakhand, Himachal Pradesh and Jammu & Kashmir are now eligible for a higher subsidy of 33.33 per cent. An amount of Rs. 9.74 crores has been released by the NABARD as subsidy for 703 projects in the States of Punjab, Tamil Nadu, Madhya Pradesh, Andhra Pradesh, Kerala, Rajasthan and Himachal Pradesh during 2006-07 (up to 30 November 2006). Since inception and till 30 November 2006, 881 projects have been sanctioned and a subsidy of Rs. 13.82 crores released to the beneficiaries.

Training and Management Development

Set up in August 1988, NIAM has been imparting training to senior and middle-level executives of agricultural and horticultural departments, agro industries, corporations, state marketing boards,

agricultural produce market committees and apex level cooperatives, commodity boards, export houses recognized by the Agricultural and Processed Food Products Export Development Agency (APEDA), CBs and NGOs. Besides these clients, the NIAM also imparts training to farmers on marketing management.

NIAM is managed by a governing body under the chairmanship of the Union Minister of Agriculture and an executive committee under the chairmanship of the Secretary, Department of Agriculture and Cooperation.

Training Activities: The Institute organized 18 training programmes, workshops, awareness programmes and management development programmes during 2006-07, up to 31 October 2006.

Management Development Programmes (MDPs): This initiative was started in the year 2003-04. Four MDPs have been successfully organized during 2006-07 for leading companies like Bayer Crop Science, MICO BOSCH etc., for the benefit of executives of these companies working in various capacities. The participants rated all these MDPs as excellent programmes and many other companies have shown keen interest in organizing such events by NIAM.

In order to generate resources and ensure optimum utilization of the expertise of the NIAM faculty, the Institute has taken up several consultancy projects in the year 2006-07. NIAM has completed infrastructural development project of fruits and vegetables cold store, grading line, ripening chamber etc., for the Haryana State Agricultural Marketing Board (HSAMB) at Shahabad, Sirsa, Rohtak, Karnal and Jhajjar. The Institute has also undertaken project formulation for the following, which are in progress:

(i) Setting up a Special Export Zone (SEZ) for mushrooms at Sonipat for the HSAMB;

(ii) Modernization of agricultural markets in Rajasthan, Tamil Nadu, Orissa;

(iii) Modern terminal markets for Rajasthan, Tamil Nadu and Orissa; and

(iv) Controlled atmospheric storage for apples at Kolkata for the State Government of Jammu and Kashmir.

The Institute introduced a postgraduate programme in agri-business management as a sub-centre of MANAGE, Hyderabad with effect from July 2001, and 50 students (26 students in the first year and 24 in the second year) are presently enrolled. The programme is designed to assist agricultural graduates to acquire the critical know-how to compete in the domestic and global business arena to make them efficient agri-business managers.

The SFAC was registered by the Department of Agriculture and Cooperation as a Society under the Societies Registration Act, 1860, on 18 January 1994. It is managed by a board of management consisting of 20 members and chaired by the union minister of agriculture as its ex-officio president, and the secretary to the Government of India in the Department of Agriculture and Cooperation as its ex-officio vice president. The managing director is the chief executive of the SFAC. It has established 18 state-level SFACs by contributing a corpus fund. The mission of the Society is to support innovative ideas for generating income and employment in rural areas by promoting private investments in agri-business projects.

The central sector scheme for agri-business development is being implemented by the SFAC in close association with CBs for (a) providing venture capital assistance to agribusiness projects; and (b) assisting farmer/ producer groups in preparation of quality Detailed Project Reports (DPRs). The scheme envisages providing venture capital assistance to 85 agri-business projects, and assist farmers/producer groups in the preparation of 100 DPRs during the Tenth Plan period. An amount of Rs 38.00 crore has been allocated for the implementation of this scheme during 2006-07. For its effective implementation, the SFAC has already signed an MOU with 15 CBs including the Oriental Bank of Commerce, United Commercial Bank, Bank of Baroda, Punjab National Bank, Central Bank of India, Allahabad Bank, Canara Bank, Vijaya Bank, the Jammu & Kashmir Bank Ltd, Bank of Maharashtra, United Bank of India, Syndicate Bank, State Bank of India, State Bank of Bikaner & Jaipur and Indian Bank.

Under the scheme, the SFAC during 2006-07 (up to 31 January 2007) has sanctioned venture capital assistance to 27 agri-business projects with varied agri- business activities involving Rs. 6.88 crores. Since the inception of the scheme, 71 agri-business projects have

been sanctioned involving venture capital assistance of Rs. 18.21 crores. These projects are expected to mobilize private investments of Rs. 194 crores, which will provide an assured market to 36000 farmers for their produce, and create direct employment for 6200 persons.

Programmes in the North-East

The details of the programmes being implemented in the North-Eastern region are indicated below.

There is no separate programme exclusively for these States. However, the outcome of various programmes in the North-Eastern states is as under:

1. The benefit under Rural Godown Scheme has so far been availed by 4 States in the N.E. Region viz. Assam, Arunachal Pradesh, Meghalaya and Nagaland. 152 numbers of projects with a total capacity of 1.43 lakh million tonnes involving Central subsidy of Rs. 4.63 crores have been sanctioned so far in these four States. It includes 39 projects with a total capacity of 0.31 lakh million tonnes involving Rs. 1.25 crore subsidies sanctioned during 2006-07. The State-wise details are given below:

State-wise number of projects, capacity and amount of subsidy released from inception upto 30.11.2006 in the N.E. States.

Sl.	States	No. of Projects	Capacity (million tonnes)	Amount (in crore)
1.	Assam	107	124430	4.21
2.	Arunachal Pradesh	1	945	0.06
3.	Meghalaya	39	13350	0.32
4.	Nagaland	5	4700	0.03
	Total	152	143425	4.62

State-wise number of projects, capacity and amount of subsidy released during 2006-07 (upto 30.11.2006) in the N.E. States.

Sl.	States	No. of Projects	Capacity (million tonnes)	Amount (in crore)
1.	Assam	34	28900	1.19
2.	Arunachal Pradesh	1	945	0.06
3.	Meghalaya	-	-	-
4.	Nagaland	4	700	-
	Total	39	30545	1.25

2. Under the scheme of Marketing Research & Information Network, 90 market nodes have been covered in the North-Eastern States. Out of these, 65 nodes have been provided with connectivity. 23 markets are reporting market data on arrival and prices of agricultural commodities. The state-wise details are as under:

States	Market Nodes Covered	Connectivity to the Markets	No. of Markets Reporting Data
Arunachal Pradesh	15	7	0
Assam	23	16	11
Meghalaya	11	8	3
Manipur	5	5	1
Mizoram	9	9	1
Nagaland	14	9	0
Tripura	13	11	7
Total	90	65	23

3. Manipur, Nagaland and Arunachal Pradesh have been notified for the implementation of the scheme of Development of Marketing Infrastructure, Grading & Standardization. However, no projects have been sanctioned in the N.E States under this scheme.

4. The Directorate has established one Regional Office at Guwahati, one Sub-Office at Shillong. Besides, one Regional Agmark Laboratory has also been established at Guwahati. These offices and the laboratory are promoting the programme of Grading and Standardization of agricultural and allied commodities in the N.E. States.

Source: Ministry of Agriculture, Government of India, New Delhi.

CHAPTER 10

WATERSHED DEVELOPMENT & DROUGHT MANAGEMENT

The key attributes of the watershed approach are conservation of rainwater and optimization of soil and water resources in a sustainable and cost-effective mode. Improved moisture management increases the productivity of improved seeds and fertilizers; conservation and productivity-enhancing measures become complementary.

The National Watershed Development Project for Rainfed Areas (NWDPRA) is the main programme for the development of rain-fed areas through the watershed development approach. The broad objectives of the NWDPRA are as follows:

- Conservation, development and sustainable management of natural resources including their use;
- Enhancement of agricultural productivity and production in a sustainable manner;
- Restoration of ecological balance in the degraded and fragile rain-fed ecosystem by greening these areas through an appropriate mix of trees, shrubs and grasses;
- Reduction in regional disparity between irrigated and rain-fed areas; and
- Creation of sustained employment opportunities for the rural community including the landless.

The Scheme of NWDPRA was subsumed with the Scheme of Macro Management of Agriculture through Work Plans from 2000-01. The scheme is being continued for implementation during the Tenth Plan under the revised guidelines with peoples' participation covering more than 6000 micro-watersheds. It is estimated to develop an area of about 20 lakh hectares during the Tenth Plan at an estimated cost of Rs 1000.00 crores. The cumulative area developed since the beginning of the Tenth Plan (April 2002 to December 2006) is 18.85 lakh hectares by incurring an expenditure of Rs 881.53 crore.

An amount of Rs 305.47 crore has been earmarked for the implementation of the NWDPRA during the year 2006-07. An area of

2.34 lakh hectares has been treated and developed at the cost of Rs 94.20 crore during 2006-07 (up to December 2006). Progress of some of the important activities under the NWDPRA for the year 2006-07 (upto December 2006) is as under:

- Run-off management structures completed during the year – 38204
- Water harvesting structures completed during the year - 38971
- Self Help Groups (SHGs) formed and operationalised – 29995
- Users' Groups (UGs) formed and operationalised – 42425
- Drainage line treatment done through– 238468 structures (all types)

Some of the benefits of the NWDPRA programme to the watershed community through various interventions are as under:

- The programme has provided employment opportunity to local people through various development activities in the watershed area.
- The programme has benefited the farmers through increased production and productivity of various crops in a sustainable manner.
- The programme has helped in the restoration of ecological balance through the plantation of trees, shrubs and grasses, etc., in the project areas.
- In some of the drought-prone States, water-harvesting structures have provided improved drinking water facilities.
- The improved ground water recharge due to various soil and water conservation measures has helped the farmers to bring more area under cultivation.
- The programme has helped in reducing soil losses and improving water conservation.
- The new mode of peoples' participation, i.e., involving the watershed community in various activities to be carried out in the watershed has empowered the local watershed community.

❖ The flexibility in the choice of technology has helped in the introduction of encouraging location-specific and low-cost indigenous technologies in the watershed.

❖ Landless families are benefited through provisions available under the livestock and service sector.

❖ There is a provision under the programme for popularising new dry-farming techniques through demonstration at farmers' fields. This has encouraged farmers to adopt new farm technology for better yields.

Watershed Development Fund

A Watershed Development Fund (WDF) has been established at NABARD, with the objective of integrated watershed development in 100 priority districts in 18 States, through participatory approach. The total corpus of the WDF is Rs 200.00 crores which includes Rs 100.00 crores contributed by NABARD and a matching contribution of Rs 100.00 crores by the Government of India.

The activities under the WDF are being taken up under the guidance of a High-Powered Steering Committee chaired by the Secretary, Department of Agriculture and Cooperation. Other representatives are from the Ministry of Agriculture, Ministry of Rural Development, Ministry of Finance (Banking Division), State Governments, NABARD and selected NGOs from different States.

Of the 18 States, 11 States viz. Andhra Pradesh, Gujarat, Karnataka, Tamil Nadu, Maharashtra, Rajasthan, West Bengal, Orissa, Himachal Pradesh, Uttar Pradesh and Jharkhand initially agreed to avail of a loan from the WDF and accordingly signed the MoU with NABARD. Subsequently however, four States viz. Rajasthan, Himachal Pradesh, Jharkhand and Orissa withdrew from the WDF. Thus, effectively only seven States viz. Andhra Pradesh, Karnataka, Maharashtra, Gujarat, West Bengal, Uttar Pradesh and Tamil Nadu are participating in the WDF programme.

❖ A total number of 427 projects (70 grant and 357 loan component) were sanctioned under the Capacity Building Phase (CBP) with a grant assistance of Rs 21.13 crores covering an area of

39287.45 hectares. These projects will ultimately cover about 4.11 lakh hectares when they enter Full Implementation Phase (FIP).

❖ A total number of 234 projects (36 grant and 198 loan) were sanctioned with a grant assistance of Rs 2.23 crores for the preparation of Project Feasibility Reports.

❖ There are 139 projects that have entered the FIP (114 loan projects with a loan assistance of Rs 54.89 crores and 25 grant component projects with a grant assistance of Rs 13.25 crores).

Watershed Development Council

During the Tenth Plan, an amount of Rs 12.00 crores has been allocated to the WDC, out of which an amount of Rs 4.20 crores has been utilized upto 31 January 2007. During 2006-07, Rs 0.80 crore has been utilized upto 31 January 2007 as against the Budget Estimate of Rs 1.35 crore.

Other Activities (2006-07)

The Department of Agriculture and Cooperation in collaboration with the Department of Land Reforms, Ministry of Rural Development assigned a project entitled: 'Comprehensive Assessment of Watershed Programmes in India', to the International Crop Research Institute for Semi-Arid Tropics (ICRISAT), Hyderabad. The project is of two-year duration and the costs will be shared between the Department of Rural Development and the Department of Agriculture and Cooperation on 75:25 basis. The total cost of the study is Rs 1.59 crore, of which the Department of Agriculture and Cooperation's share is Rs. 0.40 crore. The first instalment of Rs 1.60 crore was released from the WDC funds to enable ICRISAT to start the project during 2006-07.

Studies remaining out of the Impact Evaluation Studies of sample watersheds launched under the NWDPRA during the Ninth Five-Year Plan assigned to various institutions during 2005-06, were completed during 2006-07.

Mid-term evaluation studies of 97 sample watersheds launched under the NWDPRA during the Tenth Five-Year Plan all over

India were assigned to four Institutions. These studies are in progress.

Financial assistance was given to the Central Soil and Water Conservation Research & Training Institute (CSWCR&TI), Dehradun, for organising a conference on national resources management in collaboration with the Indian Association of Soil and Water Conservationists, Dehradun, and the Department of Soil Conservation and Watershed Development, Pune, at Pune, from 11th to 13th October 2006.

Externally-Aided Projects

A number of externally-aided projects in the area of integrated watershed development are also being implemented during the Tenth Five-Year Plan. The Department is involved in the supervision, coordination and monitoring of these Projects. The funds for these Projects are directly released to the State Governments by the donor agencies. A brief description of such ongoing Projects under the Department during 2006-07 is given below:

The details of the watershed development projects assisted by the World Bank are given below:

Karnataka Watershed Development Project: The Karnataka Watershed Development Project (Sujala) was launched in September 2001 and is envisaged to be completed by March 2007. However, to make up for the initial delays, the World Bank has agreed in principle for two years extension i.e., up to 31 March 2009. The objective of the project is reducing poverty and improving the livelihood of the people living in watershed areas by increasing the production potential and natural resources base through strengthening of institutional arrangements. The total revised cost of the project is Rs 533.76 crores. An area of 2.40 lakh hectares was developed at a cost of Rs 270.74 crores till December 2006.

Uttarakhand Decentralised Watershed Development Project: The Uttarakhand Decentralised Watershed Development Project was launched in September 2004, and is envisaged to be completed by March 2012. The project aims at improving the productive potential of natural resources and increasing income of rural inhabitants in selected watersheds through socially inclusive, institutionally and

environmentally sustainable approaches. The project envisages participatory watershed development and management, enhancing livelihood opportunities and institutional strengthening. The total cost for this project is Rs 402.00 crores. An area of 11,000 hectares has been developed at a cost of Rs 36.87 crores till December 2006.

Assam Agricultural Competitiveness Project: The Assam Agricultural Competitiveness Project was launched in February 2005, and is envisaged to be completed by March 2010. The project aims at increasing the productivity and market access of targeted farmers and community groups to stimulate the growth of Assam's agricultural economy. The total cost of the project is Rs 1024.00 crore covering 23 districts for infrastructure development like rural roads, agricultural services, market chain development, and minor irrigation. As on 31 December 2006, an amount of Rs 11.50 crore has been incurred towards preparatory activities and the development of rural roads and installation of 494 shallow tube wells.

Himachal Pradesh Mid Himalayan Watershed Development Project: The Mid Himalayan Watershed Development project became operative in October 2005, and will be completed by March 2013. The project aims at the prevention of degradation of high potential areas, prevention and protection of high bio-diversity, improving of accessibility to rural areas and productivity of livestock etc. The project envisages institutional strengthening, watershed development and management, enhancing mountain livelihood opportunities, project management and coordination. The total cost of the project is Rs 365.00 crore. Till October 2006, an amount of Rs 144.97 crore has been spent for the development of 1475 hectares.

National Rainfed Area Authority

The Government of India constituted the NRAA on 3 November 2006 to give focused attention to the problem of the rain-fed areas of the country. The Authority is an advisory, policy-making and monitoring body charged with the role of examining guidelines in various existing schemes and in the formulation of new schemes including all externally-aided projects in this area. Its mandate is wider than mere water conservation and covers all aspects of sustainable and holistic development of rain-fed areas, including appropriate farming and livelihood system approaches. It would also

focus on issues pertaining to landless and marginal farmers, since they constitute the large majority of inhabitants of the rain-fed areas.

The NRAA has a two-tier structure. The first tier is the Governing Board that will provide the necessary leadership and appropriate coordination in implementation of programmes. It will be chaired by the Union Agriculture Minister and co-chaired by the Union Rural Development Minister. The second tier would be the Executive Committee consisting of technical experts and representatives from stakeholder ministries. The Executive Committee would be headed by a full-time CEO and will also have five other full-time technical experts.

The mandate of the NRAA is as follows:

- To prepare a perspective plan, outlining the national strategy and road map for holistic and sustainable development of rain-fed farming areas.
- Evolve common guidelines for all the schemes of different Ministries including Externally-Aided Projects for the development of rain-fed /dry land farming systems.
- Coordinate and bring convergence within and among agricultural and wasteland development programmes being implemented in the rain-fed areas of the country.
- Identify rain-fed areas in different States which need priority attention and prepare watershed development programmes for integrated natural resource management in consultation with States, focusing on multi-dimensional crop, livestock, horticulture, agri-pasture integrated systems and programmes for the landless farming communities.
- Identify gaps in input supply, credit availability, dissemination of appropriate technology and other requirements relevant for rain-fed areas.
- Guide the implementing agencies on priority setting and monitor the specific interventions required.
- Develop Plans/ Programmes for capacity building of Central/ State Government functionaries in rain-fed areas.

❖ Suggest modalities to strengthen National and State-Level Institutions concerned with the rainfed/ dry land areas and establish institutional linkages with prioritized watersheds.

❖ Monitor disbursement of rural credit/ insurance cover/ safety net programmes developed for rain-fed areas.

❖ Set the research agenda including a critical appraisal of ongoing programmes and promote diffusion of required knowledge for integrated farming in rainfed areas to district and lower-level authorities.

❖ Evaluate the effectiveness of completed watersheds and concurrent evaluation of ongoing programmes.

Drought Management

The Department of Agriculture and Cooperation coordinates the Central Government's response to the management of drought in a crisis management mode. In other words, all the measures required to be taken by the Central Government to assist States in dealing with a drought situation are coordinated by the Department of Agriculture. In order to effectively discharge this responsibility, a very close watch is kept on the weekly rainfall scenario reported by the India Meteorological Department (IMD) during the South-West Monsoon and also early signs of emerging droughts. The Department also stimulates research and investigation (including documentation of managing the crisis) relating to drought. Recently, the responsibility of coordinating relief measures in the event of hailstorms and pest attacks has also been assigned to the Department of Agriculture.

Scenario in Various States: During the South-West Monsoon (1 June 2006 to 30 September 2006), the country as a whole received 886.6 mm of rainfall against the normal rainfall of 892.2 mm, with a deviation of –1 per cent. The South-West Monsoon rainfall was excess/normal in 26 out of 36 meteorological sub-divisions and the remaining 10 sub divisions registered deficient rainfall.

During the year, the State Governments of Andhra Pradesh, Assam, Bihar, Karnataka, Madhya Pradesh, Rajasthan, West Bengal, Nagaland and Arunachal Pradesh reported drought/ drought-like situation of varying magnitude. The Government of Bihar also

submitted a report on monsoon failure resulting in drought-like situation in parts of the State.

Senior officials from the GoI visited Assam, Nagaland and West Bengal for preliminary assessment of the situation. In Assam, rice is the major crop, and the area coverage under rice was less during 2006 than it was during 2005. No serious problem of drinking water or fodder was anticipated. The State Government took mitigating relief measures which included free distribution of POL to the needy farmers where shallow tube wells/low lift pump facilities were available for providing irrigation to paddy crop and distribution of certified black gram seeds to the farmers in the affected areas. In Nagaland, while no serious problem of drinking water or fodder was noticed, the State Government was advised to make area-wise and crop-wise surveys. In West Bengal, areas covered by Kharif paddy and jute were affected, but there was no report of shortage of drinking water in the affected areas. Steps taken by the State Government to assist the affected farmers included assistance to meet the cost of installation of tubewells for irrigation and repair; and renovation and restoration of different minor irrigation installations. Steps taken by the Government of Bihar to mitigate the drought situation in the affected areas included directions to ensure replenishment of water in rivers in command areas; directions to maintain a steady supply of electricity where irrigation was not possible through rivers; directions to ensure the constant supply of diesel to the farmers to enable them to run their diesel pump-sets; provision of subsidy on supply of diesel to the affected farmers; and issuing guidelines to the farmers to take steps to safeguard moisture and adopt crop diversification.

There was some damage to crops in certain areas in Nasik and other districts of Maharashtra due to a hailstorm in November 2006. A three-member team from the Department visited the affected areas for an assessment of the situation.

Source: Ministry of Agriculture, Government of India, New Delhi

CHAPTER 11

HORTICULTURE DEVELOPMENT THROUGH MISSION MODE

Horticulture development is proposed to be carried out through the programmes of the Department of Agriculture and Cooperation such as the National Horticulture Mission, Technology Mission for Integrated Development of Horticulture in Northern-Eastern States, Sikkim, Jammu and Kashmir, Himachal Pradesh and Uttarakhand; Development of Commercial Horticulture and Capital Investment Subsidy Scheme of the National Horticulture Board (NHB); and Integrated Development of Coconut including the Technology Mission on Coconut.

Further, new initiatives on micro-irrigation, National Bamboo Mission, the establishment of the Central Institute of Horticulture, Nagaland, and the promotion of bee-keeping through the National Bee Board have been taken for the development of the horticulture/ bamboo sector in India.

National Horticulture Mission

The centrally sponsored National Horticulture Mission (NHM), which was launched during 2005-06, was continued during 2006-07 for the holistic development of the horticulture sector in India, with an outlay of Rs. 1000.00 crore. Eighteen States and two UTs were covered under the NHM during the year. The thrust of the NHM is on an area- based regionally differentiated cluster approach for the development of horticultural crops, having comparative advantage. In all, 259 districts have been taken up under the cluster approach and this includes 32 new districts added during 2006-07. The activities are carried out through the State Horticulture Missions of various States/ UTs. Further, some components of the NHM are being implemented through various national-level agencies such as National Committee on Plasticulture Applications in Horticulture (NCPAH), which coordinates and monitors activities relating to precision farming and hi-tech horticulture. Others include the National Horticultural Research and Development Foundation (NHRDF); the IFFCO Foundation; the National Seeds Corporation (NSC); and the State Farms Corporation of India (SFCI), for implementation and monitoring programmes relating to vegetables and quality production of vegetable seeds and planting material. The Directorate of Cashew

and Cocoa Development (DCCD) is involved with the programmes relating to cashew and cocoa; and the Directorate of Arecanut and Spices Development (DASD) for the implementation and monitoring of the programme relating to arecanut and spices.

The programme is being monitored regularly through field visits by joint inspection teams and area officers. A web-enabled monitoring system has also been put in place to monitor the physical and financial progress on a monthly basis.

An amount of Rs. 771.86 crore was provided to the State Horticulture Missions (SHM) and national- level organizations during 2006-07. Funds have also been approved for the establishment of 1158 nurseries, bringing an area of 4.86 lakh hectares under new orchards and rejuvenating 0.64 lakh hectares of senile orchards; taking up organic farming in 0.49 lakh hectares; promoting IPM in 1.87 lakh hectares; and protected cultivation in 0.08 lakh hectares. Funds have also been approved for setting up 2281 cold storage facilities and 1083 markets.

Technology Mission

This Centrally Sponsored Scheme was launched during the Ninth Five-Year Plan period. The implementation of the scheme was later extended to the States of Jammu and Kashmir, Himachal Pradesh and Uttarakhand during 2003-04 in the Tenth Plan. The Tenth Plan outlay for the scheme was approved at Rs. 845.00 crore for implementation in the 7 North-East States, Sikkim, J&K, Himachal Pradesh and Uttarakhand. The Small Farmers' Agri-Business Consortium (SFAC) is involved in coordinating the scheme.

Under the Technology Mission, funds to the States are made available on the basis of yearly action plans/proposals, which are approved by the State-Level Steering Committee under the chairmanship of the Chief Secretary of the State Government concerned. During the year 2006-07, an amount of Rs. 157.00 crore was released, of which an amount of Rs. 81.86 crore has been released to the North-Eastern States and Rs. 75.63 crore to the hilly states of Jammu and Kashmir, Himachal Pradesh and Uttarakhand. This is against the overall allocation of Rs. 278.40 crore consisting of Rs. 150.00 crore for the North-Eastern States and Rs. 128.40 crore for the hilly states.

Some of the major achievements made so far are bringing in an additional area of 117872 hectares and 25373 hectares, of various horticulture crops in the North-East States and three hilly states respectively, of which fruits cover (54973 hectares and 18925 hectares); vegetables (20979 hectares and 4658 hectares); spices (26950 hectares and 898 hectares); plantation crops (5252 hectares); medicinal plants (1652 hectares and 170 hectares); aromatic plants (4027 hectares and 135 hectares); and flowers (4039 hectares and 537 hectares). The increase in area under horticulture crops in the North-Eastern States over the pre-mission period (2000-01) is 34.00 per cent. Among the North-Eastern States, Sikkim and Mizoram recorded a maximum percentage increase of 72.00 per cent and 71.00 percent in area, followed by Manipur (34 per cent), Nagaland (32 per cent) and Arunachal Pradesh (30.00 per cent).

In order to encourage women to be self-reliant and by taking advantage of the benefits under this scheme, several initiatives have been taken, the more prominent of which are:

- Organization/ identification of women's groups which would act as a network for channelising the horticulture support.
- Need-based assessment of woman farmers in terms of the horticulture support such as input support, technological support and extension support.
- Prioritizing the activities of individual women's groups on the basis of the need-based assessment.
- Providing adequate organizational and financial support to the women's groups for themselves with SHGs.
- Providing technical training in horticulture and allied areas to woman farmers.

So far, 18593 woman entrepreneurs have been trained on different aspects of horticulture under this Mission.

The NHB is involved in the development of high quality horticulture farms in identified belts and in making such areas vibrant with horticulture activity as hubs. For developing commercial horticulture, development of post harvest infrastructure, strengthening of market information systems and horticulture data

base. In addition, the NHB assists research and development programmes to develop products suited for specific varieties with improved methods and horticulture technology, provides training and education to farmers and processes industry personnel for improvement of agronomic practices and purchases new technologies. Several innovative schemes launched by the NHB during the Ninth Plan have been made more broad-based and entrepreneur - driven. An outlay of Rs. 100.00 crore has been earmarked for implementing these programmes during the year 2006-07. The major schemes of the Board are now back-ended capital investment subsidy schemes.

Coconut Development

The Coconut Development Board (CDB) implements programmes for the Integrated Development of the Coconut Industry and Technology Mission on coconut at a total outlay of Rs. 150.00 crore during the Tenth Plan period. To achieve the objectives of integrated development of the crop, product diversification and by-product utilization, the major thrust areas identified are production and distribution of quality planting material, and expansion of area under coconut, especially in potential and non-traditional areas. Other thrusts are improving the productivity of coconuts in major coconut producing states, developing technology in post-harvest processing, marketing activities and the integrated control of major pests and diseases. An outlay of Rs. 40.00 crore was provided for implementing the scheme during 2006-07, of which Rs. 18.00 crore has been released. Interventions by the CDB has enabled the diversifying of coconut products like desiccated coconut, coconut vinegar, virgin coconut oil and de-fatted coconut kernel products for enabling value addition and higher remuneration to the farmers.

Micro Irrigation

The Centrally Sponsored Scheme on micro irrigation was launched in January 2006 under the Tenth Plan for providing drip and sprinkler irrigation in an area of 6.2 lakh hectares. The scheme envisages achieving greater water-use efficiency resulting in enhanced productivity and better quality of produce. Under this scheme drip and sprinkler irrigation is being promoted on a large scale. Assistance is provided to all categories of farmers at the rate of

50 per cent for drip/ sprinkler system implementation and at the rate of 75 per cent for training and demonstration in each district of the State for both horticulture crops as well as non-horticulture crops. Further, training and demonstration being done by the Precision Farming Development Centres (PFDCs) at 17 locations through the National Committee for Plasticulture Application in Horticulture. During 2006-07, the annual action plans of 16 States have so far been approved for implementation as per the guidelines and a sum of Rs. 337.00 crore has been released to these States till December 2006 to cover an area of 3.31 lakh hectare.

Central Institute of Horticulture

Recognizing the importance for institutional support for the development of horticulture in the north-east, Central Institute of Horticulture Medzhiphema in (Nagaland) was set up in January 2006, with a financial outlay of Rs. 20.00 crore spread over a period of five years. The Institute is being set up at Medzhphema in an area of 43.50 hectares. The objectives and the identified programmes of the Institute are as given below:-

- Capacity building by training of trainers, extension officers, farmers, entrepreneurs, processors and exporters.
- Demonstration of improved technologies such as use of improved varieties/ hybrids, adoption of IMM/IPM practices, Hi-tech farming, precision farming, protected cultivation, post harvest technology, etc.
- Follow-on extension support in the field of horticulture.
- Promotion of organic cultivation of horticultural crops.
- Establishing convergence and synergy among programmes in the field of horticultural research and development.
- Monitoring of centrally-sponsored programmes in the area of horticulture. Activities in progress:-
- The execution of developmental works such as fencing, land preparation and creation of irrigation sources at a total cost of Rs. 1.23 crore was entrusted to the Central Public Works Department

(CPWD), Silchar on 16 May 2006. Land development and fencing work is in progress.

❖ The Institute has temporarily set up its office in the campus of School of Agricultural Sciences and Medzhiphema in order that work begins immediately.

❖ A technical expert has been appointed for the preparation of training manuals and identification of technology demonstration in the farmers' fields. A training manual on the production of fruits in the North-Eastern States has already been finalized and is under printing.

❖ The master plan for the Institute has been prepared and has also identified suitable varieties of selected crops for large-scale demonstration in the farmer's fields.

❖ The Institute organized a Master's training programme on advanced technologies on horticultural development between 26th and 28th May 2006 at the National Research Centre for Mithun, Jharnapani. There were 60 senior officers of the state horticulture/ agriculture departments who were involved in the implementation of various horticultural programmes in the north-east states and who were given intensive training on advanced technologies on horticulture. They were also identified as master's trainers for imparting further training to farmers in respective states. A brochure highlighting the programmes of the Institute was also released on the occasion.

❖ A regional workshop on cashew was organized in collaboration with the Directorate of Cashew and Cocoa Development, Cochin to discuss various issues related to development of cashew in the north-east states.

❖ The Institute in collaboration with the National Bee Board and the State Horticulture Department, Sikkim has organized a national workshop cum honey festival on the development of Apiculture on 16th -17th June 2006, at Sikkim.

❖ The Institute in collaboration with SASRD, Nagaland University, has also organized a training programme on the protected cultivation of vegetables on 15th September 2006 at the SASRD campus.

❖ The Institute has collected mother plants of 15 selected varieties of citrus and has taken the necessary steps for establishing a 'mother block' of these selected varieties.

❖ The Institute in collaboration with the National Research Centre for Cashew has identified high-yielding varieties of cashew suitable for the region and has taken necessary steps for the establishment of a mother block of these selected varieties.

National Bee Board

In view of the importance of bee-keeping in India, recently in June 2006, the National Bee Board (which was formed in 2000 and registered as a society under the Societies Registration Act XXI of 1860, with PPP including the farmers, beekeepers, processors and other stakeholders), has been restructured. The Board primarily aims to provide overall development of bee-keeping in India by popularizing state-of-art technologies relating to nucleus stock production, capacity building and training of bee breeders and beekeepers, processing and quality control bee products, etc.

National Bamboo Mission: The Department of Agriculture and Cooperation is launching a new centrally- sponsored scheme-- the National Bamboo Mission-- with 100 per cent central assistance at an outlay of Rs. 70.00 crores during 2006-07. The mission envisages the holistic development of the bamboo sector through an area-based regionally differentiated strategy.

Source: Ministry of Agriculture, Government of India, New Delhi

CHAPTER 12

LAND MARKET IN AROMATIC PLANTS KEWDA CULTIVATION IN ORISSA

Under the Mission for Millennium 2000, the Small Industries Development Organization under the Ministry of Small Scale Industries, Government of India proposed to set up five Technology Support Service Centres, of which the centre for kewda cluster at Berhampur (Orissa) is one. The project is being implemented by the FFDC (Fragrance and Flavour Development Centre, Kannauj, U.P.). The Government of Orissa by way of providing a shed in the industrial estate, Berhampur, has assisted in the setting up of the centre. A quality assurance laboratory has already been made functional and training and awareness programmes are being conducted regularly. One field distillation unit too has been installed at the Centre.

The object of the Technology Support Centre for Kewda industry is to serve the farmers, the entrepreneurs and the industry by way of providing:

(i) Assistance to the farmers in adopting agronomical practices for kewda essential oil bearing plants of higher yields;

(ii) Technical assistance on post-harvest technology, storage, packaging, sampling and marketing;

(iii) provision for testing and quality control of essential oils, aromatic chemicals, raw materials / products etc;

(iv) Facilities for the creation of fragrances and flavours;

(v) Facilities for information and documentation on developments in the fields of fragrances and flavours.

The Technology Support Centre for Kewda Industry, Berhampur renders the services such as:

a) Consultancy and training in various disciplines of essential oils and perfumery industry including cultivation of essential oil bearing plants, including Kewda;

b) Quality assurance and analytical services;

c) Processing facilities on job work basis

Essential Oils

Essential oils are the secondary metabolites synthesized in different parts of the plant such as leaves, stems, roots and seeds. These are of great perfumery and pharmaceutical importance. Natural essential oils are considered to be biodegradable and have no residual toxicity. Due to improvement in the living standards and the liking for natural essential oils as perfumery, flavouring and pharmaceutical ingredients, the demand for natural essential oils has increased manifold in the recent past. Today, the world trade of the essential oil, flavour and fragrance industry is believed to be of the order of Rs. 50, 000 crores, of which India's share is only 2-3 percent.

Unique and ideally suited for the production of almost all the essential oil species, the hilly areas of the undivided Koraput district, particularly the Kashipur, Pottangi and Koraput blocks are suitable for the cultivation of oil bearing plants such as Patchouli, Lemongrass, Citronella, Palmarosa etc. The hilly wastelands can go in for khus and the plain areas can opt for any medicinal/ aromatic plants for the extraction of oils from them.

Essential oils are important components of aroma bearing crops, which give smell (aroma) due to their volatility. The aromatic compounds, which together constitute the aroma, are generally volatile at room temperature and are found inside the essential oil preserve in the plant cells, tissues, stomata and other parts of the plant. Usually the preserved parts of the plant are roots, leaves, seeds, bark, fruits, flowers, and stem of the plant. A comprehensive list of important aroma bearing crops, their families, botanical names and parts used for the extraction of essential oil appears on **ANNEXURE-1.**

Distillation of Essential Oils

Essential oils can be achieved from a given plant by various methods of distillation, i.e. hydro-distillation, hydro-steam distillation, solvent extraction etc.

The hydro-distillation method is traditional but is being practiced throughout, particularly for the distillation of rose, jasmine, henna, and marigold, kewda etc. The distillation apparatus consists of three main parts, i.e. deg (still of copper), bhabka (receiver of copper) and chonga (condenser made out of bamboo). The bamboo, which acts as a condenser, is wrapped by gunny bags to minimize the loss of heat through evaporation. This whole system is fixed on a furnace and used for distillation.

The hydro-steam distillation is used in the distillation of aromatic crops i.e. palmarosa, jamarosa, lemongrass, citronella, mint and basil. The distillation unit is divided into three main parts i.e. still made by stainless steel or mild steel, condenser and receiver made by galvanized iron sheet. The still has a false (perforated grid) bottom, which is placed at an approximate height of 1.8 feet or more from the actual bottom and the space in between with water for steam generation. The material, which is to be distilled, is loaded on the perforated grid for distillation. During the operation of unit, the water level should be maintained at a specified level after every batch of distillation. This method gives best result with materials like seeds and roots.

In the case of steam distillation, the steam is generated in a boiler separately, which reaches the still, by a pipeline (open or perforated steam coils) below the charge or above the grid. The plant material is distilled by controlled pressure, which is dependent on the nature of the planting material. This method is commonly employed in the extraction of essential oils from herbs and leaf materials.

The solvent extraction method is adopted for processing all types of perfumes from those flowers, which do not continue to produce fragrance once they are picked. Fresh flowers are charged into especially constructed extraction at room temperature and treated carefully with purified solvent, usually petroleum ether. The

solvent dissolves the natural perfume present in the flower together with some waxes and other aluminous and colouring matter. The solution is subsequently concentrated by evaporating the solvent at low temperature under vacuum. In this method, because of low temperature processing, the oil obtained represents more truly, the natural perfume, as it is originally present in flowers.

Whereas floriculture is agronomy related to the growth of flowering plants, fragrance and flavour development programme aims at the cultivation of aromatic crops, extraction of aromatic/ essential oils and the application of oils in respect of fragrance and flavour.

The cultivation of improved varieties of aromatic plants provides regular availability of raw material to oils industry and ensures quality standard products. The production of high quality essential oils is a primary step in the growth and expansion of flavour and fragrance industry in the world.

The scope of the cultivation of traditional crops is limited due to over production and lack of demand in the market. Farmers are looking for new crops, which could be more remunerative in comparison of traditional crops to supplement their income. The essential oils derived from such crops can be re-distilled or processed further to yield their isolates, which are used directly in the flavour and fragrance industry the world over. These isolates too are in demand in the local and overseas markets. Certain aromatic crops, such as, lemongrass, matricaria, vetiver, palmarosa and basil can be successfully grown in low fertile, reclaimed or degraded land where cultivation of normal crop is not feasible.

The Kewda Plant

A general profile of kewda appears at **ANNEXURE - 2.** Diverse uses of the kewda plant are shown on **ANNEXURE - 3**

Screwpine or kewda is a densely branched shrub, rarely erect. The plant occurs in the coastal region of India, Iran, Malaysia, Mauritius and Myanamar. Though found and scattered over several coastal regions of Andhra Pradesh, Tamil Nadu, Orissa and Gujarat, the luxurious and gregarious growth is concentrated along the coastal

belt of the Ganjam District of Orissa. The traders of Kannauj, Lucknow and Kanpur have maintained their superiority in kewda trade. The other centres of kewda oil production in India are Kodamali in Tamil Nadu, Jaunpur, Ghazipur and Sahaswar in Uttar Pradesh, Alwar and Pushkar in Rajasthan. Over 500 species are known in this largest genus *Pandanus* of which 36 species have been recorded in India. *Pandanus* has a tropical distribution extending from Western Africa in the west to the Polynesian Island in the east. The plant is highly polymorphous and includes numerous varieties and forms.

In the wild state, *Pandanus* grows along the coasts producing a thick belt of impenetrable vegetation above the watermark. The plants are found growing generally on the banks of rivers, canals, fields and ponds. Though it is grown near water source, it is hardy and drought resistant. It is a tropical species and cannot withstand frost. The plant requires high rainfall. Branches and aerial roots propagate the kewda plant. The division of suckers and cuttings made from non- flowering branches and old stumps are planted. The planting is generally done from June to August and the spacing is generally maintained at 3 to 7 metres.

The shrub starts flowering after 4-5 years of planting. A 5-year-old plant attains an average height of 170 cms with a stem circumference of 50 cms and with 20-25 aerial roots and bears about 4 flowers. The flower production increases with the age up to about 25 years (24 flowers per plant). There are reports of a fully mature plant bearing 30-40 spadices in a year. The flowering depends on the branching of the plant, the rainfall and closeness of a water source. There are two main seasons of the flowering of the kewda plant. The peak season begins in the month of May/June and lasts up to September/ October. About 70 percent of the flowers are produced in this season. The rest are scattered during the year in the months of November, January and April. Generally warm and moist weather is conducive for flower production and plants are harvested by hand after breaking the stalk with the help of a stick fitted with a hook. Knives are avoided as it may damage the flower bud. The best time for the collection of flowers is early morning. The flowers are immediately taken to the distillation units for the distillation of oil.

The distillation of kewda flowers is carried out for three major perfumery products i.e. kewda essential oil (*Rooh*), kewda attar and kewda water.

Kewda Rooh: The essential oil from kewda flowers is obtained by hydro distillation and the oil is commercially known as *Rooh of kewda.* Due to the high solubility of *rooh* in water, the distillation of this genuine essential oil from kewda flowers was difficult. Today, to meet the market demand, the *rooh* is distilled using the same age-old **Deg Bhabka** technology by controlling fire, quantity and rate of distillation. Depending on the month of collection, time of starting the distillation (early morning hours preferred), the *rooh* yields are in the range of 25-35gm per 1000 flowers. The *rooh* is produced during rainy season (peak season) when the ambient temperature is comparatively low and the oil recovery is proportionally better. During hot days or when the distillation is started late in the morning, the recoveries are reported to be unsatisfactory and uneconomical. During these days, the flowers are processed for attar only. Flowers are processed in a copper vessel (**Deg**) per batch. In the process, the flowers are added with 40 litres of fresh water along with 25-30 ltrs of kewda water obtained when 400-500 flowers are added with 40 litres of fresh water along with 25-30 ltrs of kewda water obtained from a previous batch. Highly experienced hands control the rate of distillation by controlling the fire after touching and feeling the heat at the receiver (**Bhabka**).

Kewda Attar: The attars are made by absorbing the vapours of perfumes directly into a base oil e.g. Sandalwood oil. Cheaper grade attars are made when refined (purified) liquid paraffin (white oil) or Dioctyl Phthalate (DOP) are used as base oil. First the base oil is processed to suppress its original top note and the usual practice is to absorb the vapours of 2nd and 3rd distillate of *Rooh* (**Pichadi** and **tichadi** respectively) into the base oil till such time the original smell is not perceived. About 5 Kg of this matured base oil is taken in the receiver (**Bhabka**) and aroma-laden steam and vapours from flowers (1st distillation, **Agadi** only) are absorbed in it. The process of absorbing the aroma vapors is repeated till the desired concentration of kewda attar is obtained. The concentration of attar is determined by the number of flowers used per 5 kg of base oil of the different grades of attar, the most popular one is *Dus Hazara* i.e. 10,000

flowers distilled in 5 kg of base oil. Unlike the making of *Rooh*, attars are made by packing up to 1000 flowers tightly in a **Deg** and distillation is carried out somewhat faster. The time taken up by the 1st distillate (**Agadi**) is about 60-70 minutes when about 12 ltrs of water gets distilled.

Attar making is practiced throughout the year even when the quality of flowers is not that good, whereas, Rooh is produced only from fresh flowers. Since the attars are based on the number of flowers distilled, whose quality varies on several parameters such as month, ambient temperature, time of plucking, time of distillation etc., no standardization is possible. It is the trader- perfumer who has the last say after judging only by smell.

Kewda Water: The spadices are simply distilled to get kewda water. About 15-20 litres of kewda water is obtained from 1000 flowers.

Kewda Cultivation in Orissa

The state of Orissa occupies a place of pride in the field of flavours and fragrances. The varied agro-climatic conditions, rich soil recourses and abundance of human labour make the state unique and ideally suited for the production of almost all the essential oil species. The hilly areas of undivided Koraput district, particularly the Kashipur, Pottangi and Koraput blocks are fit for cultivating oil bearing plants such as patchouli, lemongrass, citronella, palmarosa etc.

Kewda is abundant in the coastal region of the Ganjam district where the plant constitutes the backbone of the local economy by way of providing raw materials viz. male inflorescence (Spadix) for the perfumery industry. The wild growing plant is being conserved and propagated as a cash crop on a large scale in recent years on account of its manifold advantages. The conservation, propagation and utilization of *Pandanus fascicularis* are mostly restricted to the Ganjam coast as compared to other regions of the coastal line. This is owing to the fact that the aromatic extract from the male inflorescence of the plant population along the Ganjam coast is of higher quality than the other regions of the country. Kewda is a hardy plant. It grows on sandy, saline, wastelands and

marshy lands on the bunds. The soil properties in Ganjam District are as follows:

PH range	:	7.5 - 8.9
Organic carbon	:	0.63- 1.24%
Soil moisture	:	16.53- 24.16%
Water holding capacity	:	23.00 - 40.00%
Soil temperature	:	18.00 - 32^0
Soil texture	:	Silty Clay loam / Silty sandy loam

The fact remains, however, that the commercial cultivation of kewda would prefer a fertile and well-drained soil.

The kewda flower distillation industry in Ganjam district accounts for nearly 90 percent of the production of commercially viable kewda perfume in the country and 50 percent of that of the world. Approximately, business worth Rs. 40 crores in kewda takes place in the Ganjam district. It is estimated that about 300- 400 thousand trees producing nearly 10 million spadices annually for the production of perfumery products are in the district of Ganjam alone. Presently, about 130 distillation units are spread over 4 blocks in Ganjam district, comprising of 44 Gram Panchayats and 230 villages with a population of 0.3 million people.

Certain basic information (approximate) on the kewda cultivation / industry in Ganjam district are provided in **ANNEXURE-4** and in the tables as follows:

Table - 1: Extent of Coverage

Sl.		Name of the Blocks				
		Ganjam	Chhatrapur	Rangeilunda	Chikiti	Total
1.	Total geographical area (in hect.).	22,031	21,312	19,910	21,587	84,840
2.	Area spread over by kewda plantation (in hect.)	5,907	12,368	14,827	4,365	37,467
3.	Canopy kewda area (in hect.)	95	1,688	2,490	522	4,795
4.	Total no. of Gram Panchayats	10 (Pre-divided)	17	21	13 (Pre-divided)	61
5.	GPs covered with kewda plantation	3	7	16	5	31
6.	Villages	35	67	73	25	200

Table - 2: Pattern of land utilization (area utilized on percentage basis) of kewda spread area

Sl.		Name of Blocks			
		Ganjam	Chhatrapur	Rangeilunda	Chikiti
01	Kewda wild	2	11	14	9
	Kewda cultivated	0	3	3	3
	Total	2	14	17	12
02	Area under habitat	6	6	17	7
03	Area under other cultivations	73	66	60	62
04	Cultivable fallows	9	6	7	9
05	Waste-land	10	8	6	10
	Total	100	100	100	100

Table - 3 : Kewda Production and Distillation

Sl.		Name of the Blocks				
		Ganjam	Chhatrapur	Rangeilunda	Chikiti	Total
01	Flowers utilized (in lakhs) Value (in lakhs) @ Rs.5/= flower	- -	183 915	160 800	17 85	360 1800
02	Distillation Charges (in lakhs) @ Rs. 360/ 1000 flower	-	65.88	57.60	6.12	129.60
03	Sandalwood oil cost of absorbent (in lakhs) @ Rs. 10,000/kg	- -	6,662 kg 666.20	1,077 kg 107.70	84 kg 8.40	7823 kg 782.30
			Total Exp.		Rs. 2711.90	

Table - 4: Distillation Units (Bhattis) and utility availed

Sl.		Name of the Blocks				
		Ganjam	Chhatrapur	Rangeilunda	Chikiti	Total
01	Total No. of Units	Nil	72	60	7	139
02	No of Vessels(Degs)					
	1000lts	Nil	235	45	30	310
	500lts	Nil	125	167	3	295
	400lts	Nil	81	225	Nil	306
	Total	Nil	441	437	33	911
03	Average Operational day/year	-	148	114	101	121
04	Average No. of vessels used/day	-	185	262	18	155
05	Average charges/vessels/day	-	1	1	1	1
06	Utility efficiency on percentage basis (Full utility being all vessels used for 300 working days with single charges)	-	20.69	22.78	18.36	20.61

Table - 5: Production of Kewda Perfumes and their Value

Sl.		Name of the Blocks				
		Ganjam	Chhatrapur	Rangeilunda	Chikiti	Total
01	Kewda concentrate (rooh in Kg)	-	130	172	30	332
	Value in lakhs @ Rs. 2.25 lakhs/Kg	-	325	430	30	830
02	Kewda Attar (with absorbent in Kg)	-	6,662	1,077	84	7,823
	Value in lakhs @ Rs. 20,000/Kg	-	1,332.40	215.40	16.80	1,564.60
03	Kewda Water (in Kg)	-	1,44,318	4,682	-	1,49,000
	Value in lakhs @ Rs. 300/Kg	-	432.954	14,046	-	447.00
Total Value in lakhs (Rs.)		-	2090.34	659.446	91.80	2841.60

Kewda: The Economic Scenario

Exotic flowers like Kewda are not transported for a long distance for fear of losing their volatile aromatic constituents. The perfumers from Kannauj (UP) move into Ganjam district for a minimum period of about 4 months (the whole of the rainy season) for kewda distillation.

Everyday, men and women gather flower spikes using long hooked poles that allow them to reach high up into the tree. These spikes are collected in manageable piles and transported to the factory by foot, bicycle, jeep, scooter or bullock cart. The veritable coastal jungle is largely inaccessible, vegetation is dense and the area is largely undeveloped with paved / dilapidated roads. One would

hardly imagine that such an area in the country produces high quality kewda products in its numerous distilleries. The flowers are collected in the early morning hours and carried to the distillation units in open baskets to help start the processing as early as possible. Longer storage of flowers results in the deterioration of the quality of products. It is estimated that about 4 crores of flowers are processed in more than 300 distillation units (Bhatti).

The price that a flower fetched in 1984 was Rs. 0.60 Ps., Rs. 4.25 in 1994 and Rs. 5.00 in 1995 and onwards. The price of a flower officially remains the same throughout the year. It rises to the extent of Rs. 11.00 to 13.00 at certain places at the peak of the rain season. The peak season lasts for about 20 days to 30 days when all the distillation vessels (**Deg**) in each and every bhatti run in full swing. The rest of the year, the bhattis run to their under-capacities. The rise in the cost of flowers during the peak season is due to the fact that the distillers rush to buy flowers, even at a higher cost to fulfill their commitment to supply *rooh* to the traders.

It is thus seen that the 100 and odd kewda villages are hamlets, where either flower collection or processing or both take place, enjoy money inflow of at least Rs. 20 crores per annum, supplementing their normal agricultural income. The picking of flowers, their transport to the bhattis are generally carried out by the womenfolk, landless / marginal farmers and the fact that the activity is limited to the early hours in the morning, their regular occupation during the day is not hampered.

The kewda processing industry engages skilled and semi-skilled labour in all the distillation related operations which include sorting, counting of flowers carrying out distillation, wood cutting and controlled firing of the furnace, clearing the stills after distillation etc. These operations engage 2-man-days of labour per 1000 flowers of distillation i.e. 80,000 man-days of labour engagement per annum.

At the factory, any green outer leaves are stripped away leaving behind the creamy white spadices only. The long spikes are then cut into three to four sections and placed in the main copper cauldron or **deg** with water. The proportion of water to flowers is roughly 2:1. The rim of the **deg** is totally encircled with a clay snake and the lid is forced down upon it using a simple metal clamp or

kamani spring, which slides under the rim and over the lid and into which a wedge is forced. One unique feature of some distilleries is that the lid is totally different than the conventional one just described. The lid is composed of a clay pot which, when inverted rests on the clay encircling the lid of the **deg**. Stones act as weights upon the pot/lid so that a tight seal is formed between the deg and the lid. This arrangement is said to produce a very special type of oil because when the aroma laden steam rises into the hardened clay dome, a very subtle earth molecule distills out and mixes with the kewda steam before it passes through the bamboo pipe (**chonga**) which connects the lid with the receiving vessel (**Bhabka**), sitting in a water bath below the **deg**. The concentration of *Kewda Attar* is determined not by the number of kilos of flowers used but by the number of spikes used per kilo or pound of sandalwood oil. The customer may specify that he wants 5,000- flower attar (*panch hazari*), 10,000- flower attar (*das hazari*), 15,000 flower attar and so on. It depends upon the end use.

In well-prepared *attar*, the sandalwood note will be present to a very minor degree if at all present. It will only come out as the attar goes into its drying out stage. But the fact is that well-made *attar* is truly the most exquisite form in which the kewda essence expresses itself. There is some subtle interaction that occurs over the period of many days that attar is being made. When a fresh batch of flowers is introduced into the **deg**, it is distilled slowly at low pressure for 10-12 hours (One can imagine how low that pressure must be as it should not blow the lid held in place by a large rock off). This process is repeated for 12-15 continuous days. The rate at which the aromatic steam laden molecules rise into the upper chamber, down through the bamboo pipe and into the receiver is calculated so that the sandalwood oil can slowly absorb the delicate aroma of the flowers. The receiver itself is being continually turned so that the material inside is continually being agitated allowing better absorption of the material into the oil as well as keeping the vessel cool which is necessary for proper condensation to occur. Along with the simple mechanics of making this process work, human effort is required to prepare real *attar*, which may contribute to the aura and mystique of the oil. The *attar*, is much liked by the people and is used as a perfume in its own right, for scenting clothes, lotions, hair oils, cosmetics, soaps, tobacco, and incense.

In an estimation carried out by a private entrepreneur, a total of 200 kgs of kewda oil (*Rooh Kewda*) are prepared each year at a cost of $7000 per Kg as compared to $1500 - $1800 for fine attar. On an average, the attar contains 3-5 percent of essence of kewda in sandalwood oil. When *Rooh Kewda* is being prepared 5 different stills are charged with 600 flowers each. Three distillations are done against one batch of flowers. It means that three receivers are assigned to each **deg**. The first distillate (*Agari*) yields 10-12 kilos of aromatic water; the second distillate (*Pichari*) yields the same. In the third (*Tigari*), liquid paraffin is sometimes kept to prepare a cheap quality "*attar*" or only the distillate is kept for making an inexpensive hydrosol. Only the first two distillates (*Agari* and *Pichari*) are kept for making the *rooh*. These are cooled down and in the evening the aromatic water is poured into one deg. It is immediately sealed and the bamboo pipe is connected to the receiver. Very gentle heat is given to the deg and about 5-6 kilos of distillate is collected in the receiver. During this time the receiver must be kept very cool and it is constantly rotated, while fresh water is added four to five times. It takes about 1 hour to produce 5-6 kilos of distillate. The receiver is then hung horizontally on a wooden stand. The water is separated and a special separating funnel collects the oil. All of the remaining hydrosol is used in making the next batch of *rooh*, which commences on the next day. About a thousand flowers (about 150-200 kgs) of flowers produce 1 ounce of *Rooh Kewda*. The *Rooh* is very potent. It contains some of the most precious top notes of the oil, which cannot even be captured effectively in an absolute. This oil possesses very important therapeutic properties as well and is used by competent Ayurvedic physicians as a stimulant and antispasmodic.

The fragrant hydrosol produced either as a primary or secondary product has many uses. Medicinally it is used as a stimulant, diaphoretic, antispasmodic. It is also one of the most important flavoring agents in preparing various food items including sweets, syrups, and soft drinks. Kewda water is popular in Northern India and is mainly used to flavour the sweets Indians can prepare from so commonplace ingredients as milk and sugar eg. *Rasgulla*, *gulabjamun*, and *rasmalai* (cottage cheese balls in condensed milk); the latter is also sometimes prepared with saffron instead. Another application is the highly aromatic rice dishes the Moghul cuisine is famous for e.g. Biriyani.

One interesting use for the hydrosol is for curing hangover. Apparently, on varied occasions, workers in the distilleries indulge in a local alcoholic beverage that packs a powerful punch. In order to clear away the effects of their indulgence, the hydrosol of Kewda is consumed. In this regard and with regard to all the above-mentioned products distilled from the flower spikes, it is critical that the genuine product be used. It is important to note that one seldom encounters a genuine kewda *rooh*, *attar* or hydrosol in the market. The chief constituent of kewda oil is methyl ether of beta-phenyl ethyl alcohol (60-80%), which gives the characteristic aroma of the flowers. This aromatic component is synthesized on a large scale in India and it is widely used to produce so-called kewda products. This single constituent is readily identifiable by any person with some knowledge of perfumery. There is not yet a great awareness about the difference between natural and synthetic products. The genuine oil, while containing a high percentage of the above mentioned component contains a great number of other aromatic molecules, which truly give the oil its complete profile. A simple Gas Chromatography/Mass Spectroscopy (GC/MS) will easily detect the adulteration as well as show the complexity of the real oil. Today it is very important for the sincere buyer of essential oils, attars and absolutes to use reputable GC/MS services to assist in the identification of pure oils. It is one part of the ethical equation in selling oils, which are claimed to be of natural origin. Incidentally, the support center for the cluster of industries on kewda, which was opened by the Government of India at Berhampur (Ganjam), possesses two sets of sophisticated Gas Chromatograph (GC) instruments for the testing of kewda oil. Of the two, the imported one is having the latest state-of-art technology with beautiful resolutions to identify even the minute constituent in the oil.

Apart from the wonderful virtues found in the distilled products of the flowers, each part of the plant possesses in its raw form, many medicinal, culinary, cosmetic and other uses. The **flowers** are considered acrid, bitter, aphrodisiac, demulcent and anodyne and are used for a variety of head and skin problems. The anthers and tops of the bracts of flowers are powdered and inhaled like snuff to treat epilepsy. Cigarettes are made of the interior of the anthers and smoked to treat sore throat and other throat problems. A juice is prepared from the entire spike from which the spathes have

been removed to treat rheumatic arthritis in animals. The **leaves** are acrid, bitter, alexeteric, aphrodisiac, depurative and somniferous. They have been used for treating leprosy, syphilis, small pox, scabies and diseases of the heart and brain. The **roots** are bitter, sweet, acrid, thermogenic, emollient, depurative, antiseptic, cephalic, carminative, deodorant, vulnerary, febrifuge, soporific and tonic. They are employed to treat leprosy, wounds, ulcers, skin diseases, flatulence, colic, fever, diabetes, sterility, general debility, to name but a few. The spiny, fibrous **leaves** of kewda plant find use in making matting, cordage, hats, bags, and baskets. Different methods are used for removing the spines from the leaves so that the above products can be used without injury to the hands. Using time-honored methods, requiring patience and simple technology, indigenous people of India, Malaysia, Mauritius, and other countries where the plant grows, are able to turn the leaves into items which make their lives self sufficient. In some localities the leaves are also used for making papers and thatching the roofs of homes. The **roots** also are fibrous in nature and find a place in basket making as a binder. Cutting the roots into lengths and then pounding them out forming a coarse painting surface make a type of local paintbrush.

The major income generation is in the production of flowers. A few progressive farmers have already started planting kewda in their paddy lands and there is plenty of scope for standardizing the agro technology of the plant. Agronomical studies of the kewda plant are scanty in literature and useful scientific research on the chemo/geno types is yet to be taken up fully by any organization.

Resort to institutional finance is scarce.

The State Government has imposed a tax of 4 percent on the cost of the flowers. The issue has raised many questions:

(i) Who will pay tax? (a) the poor woman plucking a few flowers early in the morning or (b) the middleman who collects flowers in different localities and supplies to the distillers or (c) the distiller himself.

(ii) Generally, every distillation unit has a number of distillation sets (degs) for hydro-distillation of flowers. Throughout the year, the sets

are idle because of over capacity and during the peak season, all the sets are utilized subject to the availability of flower to the unit. In such a case, the calculation of tax on the unit is difficult.

(iii) There is no open market for *rooh kewda.* The oil is costly (on an average Rs. 2.50 lakhs per litre subject to market fluctuations) and all the transactions are made clandestinely. The small distillers are sometimes getting harassed by the buyers in the name of quality, adulteration etc. To get a true picture of the total distillation made during a particular season, which in turn, will arrive at a particular tax structure, is cumbersome.

The district of Ganjam is famous for the migration of labour to Gujarat to work in the textile industry. Incidentally, the area falling under natural vegetation of kewda and its distillation is certainly devoid of the migration of labour. However, to avoid poverty and unemployment, Kewda deserves a systematic study for organized business.

Although the distillation of kewda oil is reportedly 80 year old, no scientific institution has truly come forward for modernizing the distillation process. At the instance of NABARD, the Regional Research Laboratory (a CSIR set up) at Bhubaneswar has carried out some work on the distillation process of kewda flowers. The distillers and perfumers have outright rejected the same, for want of the specific fragrance properties that the deg-bhabka method provides.

Most of the kewda area is inaccessible. The roads are either dilapidated or do not exist at all. Transport system in the area should be taken up on a priority basis to bring the business to limelight.

Land Market Issues in Kewda

1. The farmers take the kewda flower to the local distillation unit. There is no official intervention in the growth of the flower; it is all left to a conducive soil and conducive ecology.

2. Distillation continues to be traditional and is bound to remain so as the product distilled through the Deg-Bhabka finds favour with the perfumers/buyers from Kannauj etc. Slight deviation in fragrance

coming through improvised devices affects acceptability in the market.

3. The inter-connection between the farmer, distiller and perfumer, being traditional and inextricable, no space is left for any other intervention.

4. The exact nature of ties of relationship between the grower, the distiller and the perfumer is never known. There are under currents, with chances or possibility of the perfumer owning captive farms and distilleries. There is always a local manager or caretaker to take care of the interests of the perfumer.

5. The bonds between the perfumer and the user/industrial houses remain unknown. The respective margin of profits earned by them is nowhere clear. Hence, the evaluation of prices charged respectively by the grower from the distiller or from the perfumer by the distiller remains elusive.

6. In the given circumstances, it remains almost a day-dream, an improvement in production/ distillation techniques or technology or a rationalization of price structure at various levels. It remains a will o' the wisp forging direct links between the local distillers with the user companies, eliminating the outside perfumers. The immediate visible man is the perfumer, who bids and controls the purchase price of the flower, makes advance or immediate payment and remains the most visible on-the-spot immediate broker. His powers over the grower are enormous.

7. There has not been any socio-economic survey of the kewda industry from the farm to the user plant.

8. No genetic (Genome) study in kewda has so far been carried out by the Indian Council of Agricultural Research (I.C.A.R.) / Dept. of Science & Technology (D.S.T.).

9. There are sporadic fluctuations in kewda flower prices, all controlled by the perfumers. There is no hard and fast fixity about the flower prices as is common in private biddings. There is competition and profiteering. Hence, it will be a risky proposition for

the Governmental agencies coming in the fray and intervening through procurement strategies guided in turn, by the ultimate perfumers market.

10. Whether the bargaining strength of the farmer/ really local distiller can be enhanced through training, orientation, formation of cooperatives and the like is debatable and has not been thought of with respect to the various layers of the existing marketing structure.

Organizing Interface

Director, Horticulture, Orissa has so far organized the following interface workshops at Bhubaneswar covering certain focal economic themes in citrus/vegetables, floriculture and vegetables:

1.	26/27-4-2003	Interface workshop on Citrus vegetables
2.	21-01-2004	Interface workshop on floriculture
3.	5-2-2004	Interface workshop on vegetables

The interface workshop on floriculture was held on 21.01.2004. The florists and flower cultivators from all over the state attended the workshop. All the Deputy Directors of Horticulture, many horticulturists and experts from the Orissa University of Agriculture and Technology (OUAT) also attended the workshop. The following points emerged in the course of the workshop:

1. Most of the flower cultivators complained about lack of proper marketing facilities for which they were unable to get proper price for the flowers.

2. The general consensus was that there should be good relationship between the growers and traders in the interest of both the groups.

3. The opinion was in favour of application of bio-fertilizers in the flower crop to get quality flowers and also to enhance the keeping quality.

4. Timely availability of quality planting materials at reasonable cost was considered as a major constraint for flower cultivation.

5. Suggestions were there to develop literature on floriculture cultivation, harvesting and post- harvest technology, packaging, transportation and trading.

6. Some cultivators suggested that there should be an arrangement to disseminate the information through electronic media about prevailing market price of flowers, availability of various planting materials. Some farmers complained about the exploitation and also non-payment / irregular payment by the traders. Particularly, when there is a large arrival, the farmers are forced for distress sale.

7. The traders complained about the non-availability of designated places for the sale of the flowers. They demanded that kiosks should be provided to them permanently for selling of the flowers. Some space should be earmarked for the trading of flowers with proper infrastructure like cold room, space for display of flowers and space for storage etc.

8. At present, the florists are operating unauthorized from footpath only for which they are often harassed by municipal authorities.

9. The traders complained about lack of continuity in the supply of flowers by the local farmers. They are forced to get the flowers from outside the state. The farmers should cultivate the flowers in compact patches in staggered manner keeping the market demand in view.

10. The traders wanted that traditionally grown flowers and leaves like jasmine, hibiscus, champak, kewda, dub grass, ber leaves, bel leaves and ornamental foliage like thuja leaves, asparagus leaves etc. have got good demand, and that the farmers should **cultivate these species and provide supply.**

11. Export oriented flower business in cut flowers; cactl and orchids should be developed.

There could probably be a breakthrough in the existing thaw in the land market in kewda, if the Fragrance and Flavour Development Centre (FFDC), Kannauj (UP)/ Technology Support Centre for Kewda Industry (TSCK), Berhampur decide to organize regular interface workshops on kewda as also do a bit in farmer/

distiller - organization to extend to them capacity building support services. The advantages of inter-group discussions, demonstrative training, supply of input and technology, sensitization and the like cannot be exaggerated. At least, there has to be a perceptible honest endeavour to drill a bare hole in the impenetrable wall of tradition and conscious tolerance of exploitation.

Acknowledgement

1. Dr. B. Dash, Dy. Director (Chemical) & Incharge, T.S.C. for Kewda Industry, B/1 Industrial Estate, Berhampur- 760008 (Orissa).
2. Dr. Narayan Das, Dy. Director (Horticulture), Berhampur - 760001 (Orissa)

ANNEXURE – 1

Important Aroma Bearing Crops, their Families, Botanical Names and Part Used

Common Name		Botanical Name	Family	Habit	Part Used
1.	Musk dana	Abelmoschus moschatus	Malvaceae	Annual herb	Seeds
2.	Sowa	Anethumgraveolens	Umbelliferae	Annual herb	Seeds
3.	Dil Seed	Apium graveolens	Umbelliferae	Annual herb	Seeds
4.	Davana	Artemisia pallens	Compsitae	Annual herb	Aerial parts
5.	Ylang Ylang	Chanaga odorata	Annonaceae	Perennial tree	Flowers
6.	Cedar wood	Idrus deodara	Pinaceae	Perennial tree	Wood
7.	Lemongrass	Cymbopogon flexuosus	Gramineae	Perennial herb	Leaves
8.	Citronella	C. winterianus	Gramineae	Perennial herb	Leaves
9.	Palma Rosa	Martinii	Gramineae	Perennial herb	Leaves/ flowers
10.	Kewda / Kewda	pandanus fascicularis	Pandanaceae	Perennial shrub	Flowers
11.	Eucalyptus	E. citriodora E. globulus	Myrtaceae Myrtaceae	Perennial tree Perennial tree	Leaves Leaves
12.	Iris	Iris pallida	Iridaceae	Perennial herb	Rhizome
13.	Jasmine	Jasmine sambac	Oleaceae	Perennial shrub	Flowers
14.	Lavender	L. officinales	Labiatae	Perennial shrub	Aerial parts
15.	Japanese mint	M. arvensis	Labiatae	Perennial herb	Aerial parts
16.	Bergamot mint	M. citrata	Labiatae	Perennial herb	Aerial parts
17.	Peppermint	M. piperita	Labiatae	Perennial herb	Aerial parts
18.	Spearmint	M. spicata	Labiatae	Perennial herb	Aerial parts
19.	Matricaria	M. chamomilla	Compositae	Annual herb	Flowers
20.	Sweet basil	Ocimum basilicum	Labiatae	Annual herb	Aerial parts
21.	Geranium	Pelargonium graveolens	Geraniaceae	Perennial shrub	Leaves
22.	Patchouli	Pogostemon patchouli	Labiatae	Perennial herb	Leaves
23.	Rose	Rosa damascena	Rosaceae	Perennial shrub	Flowers
24.	Clary sage	Salvia sclarea	Labiatae	Perennial herb	Aerial parts
25.	Sandalwood	Santalum album	Santalaceae	Perennial tree	Heart wood
26.	Mari gold	Tagetes minuta	Compositae	Annual herb	Flowers
		T.erecta	Compositae	Annual herb	Flowers
		T.petula	Compositae	Annual herb	Flowers
		T.glandulifera	Compositae	Annual herb	Flowers
27.	Khus	Vetiveria zizanioides	Gramineae	Perennial herb	Roots
28.	Vanila	Vanila planifolia	orchidaceae	Perennial herb	Fruits (Beans)

End Uses / Application of Essential Oils

The ingredients of essential oils are used in very small quantities in the manufacture of end products. The demand of essential oil depends on the end use sectors, which are as follows:

Sl.	End use sector	Type of essential oil
1.	Soft Drinks	Citrus, Spice, Vanilla flavour and floral
2.	Soap and Detergents	Citronella, Patchouli, Rosewood, Lemongrass and Citrus.
3.	Toiletries	Lemongrass and Citronella
4.	Therapeutical	Mint, Sandalwood, Spice, Henna, Eucalyptus and their derivatives.
5.	Confectionery	Vanilla, Mint and Lemon
6.	Pharmaceutical	Mint, Spice, Eucalyptus and Basil

ANNEXURE - 2

General Profile of Kewda Plant

Family	:	Pandanaceae
Species & Varieties	:	Pandanus fascicularis Lam. (Kewda) Pandanus fascicularis var. (Ketaki) Pandanus odoratissimus Linn. Pandanus tectorius Soland ex Parkinson
Most common Species in India	:	Pandanus fascicularis Lam (Syn, Pandanus odoratissimus Linn.)
Common names	:	Screw Pine, Umbrella Tree (English). Ketaki (Sanskrit), Kewra, Keora, Kewda (Hindi) Kedgi, Kevda (Marathi, Gujarati). Kiya, Ketaki (Oriya). Keya (Bengali). Kedige (Kannada). Thazhai, Thazhampoo (Tamil). Mogali (telugu). Kaitha (Malyalam).
Distribution	:	India, Iran, Malaysia, Mauritius, and Myanmar.
Uses	:	- Flavours (food & beverages) - Perfumes - Traditional medicines - Paper, Rope making, Thatching, Baskets etc.

ANNEXURE - 3

Diverse Uses of Kewda Plant

The Plant	:	=>	A good soil binder
Roots	:	=>	Long aerial roots contain very strong fibres, which are mostly used for making ropes and baskets. The fibres are also useful for making high quality handmade paper.
Leaves	:	=>	Used for covering huts, for making mats, cordage, hats and baskets.
		=>	The fibres present in the leaves can be utilized for papermaking.
		=>	Therapeutically the leaves are very much valuable in the treatment of leprosy, smallpox, scabies, and leucoderma. The tender leaves are valuable in curing diseases of the heart and brain.
The inflorescence (Male flowers)	:	=>	The tender buds are sometimes eaten raw or in a cooked form.
		=>	The juice or the inflorescence is useful in rheumatic arthritis in animals.
		=>	Anthers of male flowers are considered for curing diseases of blood.

Production of kewda oil / attar / water.

Kewda oil	:	=>	Used as a stimulant
		=>	Antiplasmodic
		=>	Relieves headache
		=>	Anti Rheumatic
Kewda Attar	:	=>	Blends with all types of perfumes,
		=>	Used for scenting clothes, bouquets, lotions, cosmetics, soaps, hair oils, tobacco, pan masala, agarbatti etc.
Kewda water	:	=>	Used for flavouring of sweets, syrups, soft drinks etc.; Cures many skin diseases.

ANNEXURE – 4

Kewda Industry in Ganjam District
(BASIC INFORMATION)*

1.	Area covered by kewda plantation	:	5,000 Ha
2.	From sea - coast, the kewda plantation area	:	
	Within 5 Kms		80 - 85%
	Within 5 - 10 Kms		15 - 20 %
	More than 10 Kms		-
3.	Total flower production in the district	:	375 lakhs (@ 7500 flowers / Ha)
4.	Cost of flowers	:	Rs 18.75 crores (@ Rs. 5/- per flower)
5.	Production p.a.		

Item	Quantity in Kgs.	Rate (Rs.)	Value (Rs. In lakhs)
Kewda Oil (Rooh)	346	2,50,000	865
Attar (Sandal wood oil base)	8150	8,150	1630
Kewda water	1,55,000	300	465

* **Estimated data are approximate only**

CHAPTER 13

AGRICULTURAL REVIVAL: NEED FOR A HOLISTIC APPROACH

Assured Irrigation, Nutrients & Subsidies

Water is a leading policy issue in all programmes for agricultural revival in our country. Over 58% of irrigation is now taking place from ground- water drawn from wells and tube-wells, using an estimated 6.5 million diesel pumps and 11 million electric pumps. This eats into costly oil reserves while making farming virtually unviable for small farmers. Over 15% blocks in the country are now groundwater deficient. Irrigated land in India, which is 47 million hectares (Mha), produces 56% of foodgrains while the rain-dependent 95 Mha land yields just 44%. Providing water to this vast, unirrigated area will not only boost food production, but also help struggling farmers, out of poverty.

According to the Ministry of Water Resources, there are 388 incomplete irrigation projects spread all over the country. Of these, 340 were started before 1992, and 40 before 1974. Till 2003, Rs. 78,499.63 crore had already been spent on them, and an additional Rs. 89, 872.72 crore was needed to complete them. Had these projects been completed on time, over 20 Mha of land would have come under irrigation. However, only about 7 Mha worth of irrigation facility has actually been created. Twenty- four state governments were supposed to implement these projects. Since they claimed that they were fund deficient, the Centre announced the Accelerated Irrigation Benefits Programme (AIBP) in 1996 for completing 172 of the more wide-impact projects in two years. Half the money was to be given by the Centre as loans while the respective state governments were to bear the remaining expenses.

By 2003, about Rs. 19,000 crore had been released for the programme of which around Rs. 13,000 crore had been spent. Only 23 projects had been completed in seven years. Of the targeted 10 Mha land to be irrigated, work for covering only about 2.8 Mha was completed. Even out of this, only 0.3 Mha was actually being irrigated.

In a scathing indictment of the way AIBP has been implemented, the Comptroller and Auditor General (CAG) pointed out that in many cases, projects selected for inclusion in the programme were either not taken up, abandoned midway or declared complete when they were not.

CAG carried out actual test audit of about Rs. 8,146 crore of the money spent and came up with shocking results. Nearly Rs. 3,000 crore had been misutilised, diverted to other uses, reported as inflated expenditure or parked in bank accounts. It also found that, in order to accommodate requests from states, several ineligible projects were included in the programme.

The Government then came up with a major new programme- Bharat Nirman under which irrigation was a key sector. The goal of creating 10 Mha of fresh irrigation potential in four years (2005-06 to 2008-09) was set up.

However, results of this special thrust to irrigation have also been disappointing. In about two years of implementation, only about 2.2 Mha worth of irrigation potential has been created, that is, 22% of the target. The rest 78% remains to be created in the next two years[1].

The use of fertilizer is associated with assured irrigation. The continuation of the fertilizer subsidy without creating sufficient irrigation infrastructure accentuates the regional disparity in agriculture. Canal water is subsidized, which further widens the gap between rain-fed and irrigated areas. Canal water should be priced such that resources collected out of irrigation charges are more than sufficient for the maintenance of canals and channels. Similarly, the price of power used for agricultural purpose should be at least half of the pooled cost of power generation in the state. In this perspective, a re-look at agricultural subsidies is important. This, however, does not mean transfer of adequate resources from subsidies to investment in agriculture. Agriculture as in developed countries should continue to attract higher government allocation. And a massive injection of resources to agriculture should not raise any eyebrow as long as quality of expenditure is not questionable. The quality of expenditures here refers to the inclusiveness of the poorest

of the poor farmers, and this should be the only criterion to distinguish investments from subsidies in agriculture[2].

It is the production capability and export potential of any country that will help them benefit from the removal of farm and export subsidies. Even with the rise in world prices, the supply response of Indian farmers for rice and wheat is expected to be negligible. Cotton and sugar farmers in the short term might increase the production by 6.4% for cotton and 9.65% for sugar. But this too is constrained by farmers' inability to respond effectively due to lack of access to inputs such as credit, infrastructure, markets and export-oriented policies for expanding their operations.

The supply side is constrained with the problems of low productivity, proper irrigation facilities, land constraint along with crop diversification in response to increasing demand of high value commodities. Projections made by the working group for the Eleventh Five Year Plan show that by 2011 we would just about meet the domestic demand for most of the agricultural commodities. This along with our random decisions to ban export of agricultural commodities due to domestic supply constraints raises questions about our potential and credibility to export agricultural produce[3].

Investments in Agriculture

There is a contradiction between the interests of farmers who have a marketable surplus and the interests of the consumers. In a democracy both sets of views will be articulated, creating problems for the government. The government needs to ensure that farmers get the market price for their product. Its agencies such as the FCI would have to compete in the open market. Indeed, as in the case of the railways, it is quite possible that the FCI's performance will improve when faced with competition. In any event, the government will have to pay whatever the food subsidy required. It should not seek to reduce its self -imposed fiscal burden by beating prices by way of reduced competition. Since the fundamental problem is that of stagnant supply, in the medium term, price incentives would be a major force in increasing production. Further, given the two decade-long slowdown in public investment, the government should welcome private sector involvement in what used to be called extension

services. This involvement is bound to increase if large corporate buyers are assured that they will not be evicted from the market[4].

The investments in agriculture are meant to improve infrastructure through capital formation in areas like irrigation, soil and water conservation, land development, crop husbandry, dairy development, agricultural research and education, plantation, etc. It is interesting to observe that the decline in public sector investments coincided with increases in subsidies. During the five years from 1980-81 to 1984-85, the level of public investment was 3.51% of GDP agriculture while subsidies were at 4.01% of sectoral GDP. During 1985-86 to 1989-90 the magnitude of public investments declined to 2.96% while subsidies increased to 4.96%. During 2001-03 public investments further dropped to 1.89% of GDP-agri, while subsidies increased to 7.42%. Though there is more than one reason for the decline in public investments in agriculture, resource transfer from the capital account to the revenue account to meet rising bill of subsidies is directly related to it.

In order to understand the trade-offs between public investments and input subsidies we need to distinguish between the productive and destructive role of subsidies. Subsidies on fertilizers in the initial stages promoted fertilizer use and contributed to productivity. But subsequent concentration of fertilizer subsidies on only one type of fertiliser (Urea) has adversely affected the soil's nutrient balance leading to an adverse impact on fertility and productivity. Subsidies on power supply are doing the greatest damage to groundwater resources and are a threat to sustenance of agriculture. Similarly, irrigation subsidies are affecting operation and maintenance of the system and ultimately leading to poor delivery. There are cases of destructive subsidies. It has become highly desirable to put a stop to free power and curb power and irrigation subsidies, and use the saved resources for investments. In the case of fertiliser, there is a need to remove distortions in NPK price ratio and reallocate fertilizer subsidies to NPK and micronutrients. Shifting a part of subsidies from existing items to promote production and adoption of quality seeds is a case where subsidies can play a productive role[5].

G 20 group of developing and emerging nations has called on the trade majors to show engagement, flexibility and political will for

an ambitious and balanced result. Balance in agriculture and between agriculture and NAMA (Non- agricultural market access) should be ensured based on the commitment to make the Doha Round a development round. It should take into account the mandates contained in the Doha Declaration, the July 2004 framework and the Hong Kong Declaration.

G 20 holds that the centre of gravity in domestic support should reflect the commitment to real and effective cuts. This is especially so in relation to the OTDS, for which a "low teen" number reflects the only possible outcome and position of an overwhelming majority of members. The members have called for the incorporation of a combination of cuts and disciplines in agriculture.

Disciplines must credibly avoid product shifting or box shifting.

Also trade distorting support in the Green Box should be prevented. This should be complemented by an effective mechanism of monitoring and surveillance, while incorporating the programmes of developing countries that support agrarian reform, poor and small farmers and fight against hunger[6].

The Pulse Shock

The production of pulses in our country has remained stagnant for the last 4 decades. It has moved in the narrow band of 12 million tonnes to 14 million tonnes per year. In the past 20 years, it has shown an annual rate of growth of 0.33% per annum. One important reason for this is the fact that the area under pulses has remained almost the same.

Further, there has been no major technological breakthrough in this crop and certified seeds are not available in adequate quantity. Usually inferior lands are devoted to the production of pulses. When these lands get irrigation, farmers switch over to other crops. Finally, the government has not supported pulses in any significant way. One programme was launched in the Fourth Plan and another one in 1991- but both were lackadaisical attempts.

For the post- 1985 period, the virtually stagnant domestic production of pulses has meant that the government has had to allow imports when domestic production had fallen. The imports have played an important role of keeping the total supplies somewhat stable. Even then, the total supply in the past 20 years has increased at the rate of only 0.39% per annum.

The government needs to balance the interests of the farmers and that of the consumer-something that is easily said than done. First of all, the domestic production needs to be increased. The productivity of pulses in India is very low- it is only a third of that in China and one-tenth of that in France.

In the short run, at least, there is no option to imports. India imports from Myanmar, Canada, France, Australia and Iran. Should India import only to compensate for the domestic shortfall or should it also aim at making the pulses cheaper, is the moot question.

Incidentally, the world production too has increased at a very low rate of 0.48% per annum and the unit value of imports has increased by three times in the past 20 years. Consequently, supply and prices could become a problem even in the international market[7].

Rice Supply

Supply is unable to keep pace with demand. Rice production has been growing at a slower rate than consumption, leading to depletion of stocks and an upward trend in rice prices in the world market. With already intense pressure from population and industrialization, there is little extra land that can be brought into crop agriculture. Productivity (kilos of paddy per acre) is either stagnant or increasing at snail's pace in most rice-growing countries. Yield growth has decelerated substantially since 1990 in China, India, and Indonesia, which together account for nearly 60% of the global rice production and consumption.

In the US, land under rice is shifting to corn and wheat because the returns on these grains are higher. The USA has already blotted its copybook with rice-importing countries such as the EU with the traces of genetically modified rice in some consignments last year, some shift in acreage from rice to corn and soya will also occur

in Brazil, Argentina and Uruguay with no back-slide in bio-diesel demand.

Overall in 2007, while the world will produce 415 million tonnes rice (3 mm tonnes lower than 2005), it will consume 417 mnt, a 3- million-tonne jump over 2005, says USDA. The only reason why prices have not skyrocketed even higher is because of unsold stocks of rice from previous years lying with the market[8].

Biotechnology & Genetically Modified Crops

India is facing a nutritional crisis according to the National Family Health Survey (NFHS- III), with 45.9% of children below the age of three- that is, about 45 million little girls and boys- are underweight or malnourished and among the married women in the age group of 15-49 years, the prevalence of anaemia has risen to 56.1% in 2005-06. Agriculture biotechnology can help in alleviating such problems by producing nutritionally enhanced crops. With limited or shirking arable land, a burgeoning population and ever increasing agronomic challenges, there is already increasing evidence that biotechnology as a tool can play a very important role in achieving the goal of food for all.

In India, where roughly 60% of cultivated land is not irrigated, and which faces frequent droughts and pest attacks, the benefits of GM (genetically modified) crops that could be drought / pest resistant, could be enormous in improving the livelihood of farmers. The example of cotton is an interesting one in this regard. Cotton is a pest-prone crop, and the genetically modified Bt (Bacillus thuringiensis) cotton is basically designed to overcome that problem to a large extent. In 2006, one million farmers seem to have planted this GM crop and one year later, India is poised to export more than four million bales of cotton for the first time in its history. One could say it is resounding success of Bt cotton[1]. More than 95% of acreage under genetically engineered crops is accounted for by four crops: corn, canola, soya, cotton. Cotton is clearly not a food crop. As far as corn, canola and soya are concerned, most of the production was going for cattle feed and is now increasingly going to industrial biofuels. Only two traits account for 95% of the commercially planted genetically engineered crops. These traits are herbicide resistance and introduction of BT toxin genes from a soil bacterial into plants.

BT cotton is the main crop that has spread in India. Most of the BT cotton planted is owned and controlled by Monsanto, even when licensed to other countries. Whenever BT cotton has been sold through Monsanto's monopoly, there have been high rates of failure, high rates of indebtedness and high levels of farmer's suicides resulting from debt. The Andhra Pradesh government has been compelled to take Mosanto to the Monopoly and Restrictive Trade Practices (MRTP) commission because of the unjustifiably high prices the company is charging farmers.

Genetic engineering goes hand in hand with patents on seeds and monopoly control. Monsanto has gone on record that it has every right to charge what it wants from farmers because it has intellectual property rights, and governments have no right to regulate prices. It has also been argued that citizens have no right to information on biosafety because this is confidential information protected by intellectual property. Such a system, which denies farmers their right to seed and citizens their right to information is a threat to democracy and freedom.

The commercial cultivation of GM crops is now moving to its second decade and these are being grown on 252 million acres in 22 (11 industrial and 11 developing) countries by more than 10.3 million farmers, 90% being resource poor from developing countries. According to the 2006 ISAAA (International Service for the Acquisition of Agribiotechnology Applications) report, the 60- fold increase of GM between 1996 and 2006 makes it the fastest adopted crop technology in history. The statistics suggest farmers have given their verdict on biotech crops because of the significant agronomic, economic, environmental, and societal benefits.

As far as safety is concerned, any new technology in agriculture takes nearly 10-15 years from discovery to commercialization. On average, companies spend 15% of revenue in R & D conducting rigorous biosafety, nutritional, food and environmental safety studies following detailed agronomic evaluation of crops through small and large-scale field trials. The data across locations and climatic conditions are submitted to the regulatory authorities for further scrutiny and the whole process typically takes five years.

The EU Commission report summarizing 81 biotech research projects concluded that "the use of more precise technology and greater regulatory scrutiny probably make them even safer than conventional plants and foods". Similar sentiment has been echoed by a multitude of international agencies including WHO and FAO of the United Nations.

Tissue-culturing of banana plants, a bio-technology initiative to increase the yield by five times of traditional farming- is becoming popular among farmers in Oman, Middle East, Pakistan, Sri Lanka and Africa. Farmers in the Middle East and other countries cultivate the traditional variety of banana which gives very low yield all over Central Asia. Since the market potential for bananas is very high in the Middle Eastern countries, the demand is met through exports from Philippines, India and South American countries.

In India, farmers in banana growing states like Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka, Madhya Pradesh, Uttaranchal, Chhattisgarh, Uttar Pradesh, Manipur, Nagaland, Assam, Punjab and Orissa have been cultivating tissue-cultured banana for the last few years.

Banana is a globally important fruit crop with 97.5 mt. of production. The annual production of banana across the country is 17 mt. from 4.9 lakh hectares of land. The area under cultivation for tissue-cultured banana would be around 40-50%. The annual yield for traditional banana farming using drip irrigation technology was 65 tonnes per hectare. The use of tissue culture technology, however, has further enhanced this yield to 95-100 tonnes per hectare. Moreover, the traditional banana plants bloom in 16-18 months while the tissue- cultured plants bloom in only 11 months. The tissue-culture technology is getting overwhelming response from the farming community in the country and abroad.

Scientists in the United States hope to replace winter wheat with new breeds that can survive year- round for up to five years. Jim Robbins, writing in the New York Times says it is a gleaming prize for wheat farmers, and environmentally healthy, as well: a perennial food plant that requires plowing only once every three to five years and prevents dust storms, stems soil erosion and even absorbs carbon to

help mitigate climate change." The latest search for perennial wheat began a decade ago at the Washington State University, with a big question: what are the genetics that govern a Plant's annual nature? The answer is, it is only a single gene that convinces a plant not to die. Once that gene is by-passed through breeding, the question is, does it have what it takes to live? That answer is considerably more difficult. Successful perennial wheat not only has to live, but it also has to do it in the right ways: it has to enter a dormant cycle in the fall and then return to life in the spring, it has to look like wheat, have a satisfactory yield and thresh cleanly.

Agricultural Residues Bio-Fuels & Fuel Farming

India generates 600 million tonnes of agriculture residues every year. Most of this is burnt by way of waste disposal, as the farmer wants his fields ready for the next crop. A small part of the residues may be used for mulching, for fuel (for cooking) or as fodder.

Three types of energy can be produced from these residues. Liquid fuels such as ethanol or pyrolysis oil; gaseous fuels like biogas (methane) and electricity.

Ethanol, which can be used as transport fuel can be produced by lignocellulosic conversion of residues. Extensive R & D is being done the world over to optimize this technology. A few large plants in Canada, Japan, and the US have already been set up with this technology. Nevertheless, a lot of research needs to be done to make ethanol production from residues economically viable and environmentally sound. Theoretically, residues in India can produce 156 billion litres of ethanol, which can take care of 42 per cent of India's oil demand for the year 2012.

Pyrolysis oil is produced by rapid combustion of biomass, which is rapidly condensed so that the ensuing vapours or smoke yield oil that is nearly equivalent to diesel. Around 20 per cent of charcoal is also produced as by-product in the process. The charcoal can be used as cooking fuel for rural households. Pyrolysis oil technology was developed in early 1990s in Europe and North America and is now maturing. A few plants have been set up in

Canada, the US and China. Nevertheless, R&D is still needed to make it suitable for use in existing internal combustion engines. Recent experiments in Sweden on running a 5-MW diesel power plant on pyrolysis oil have been successful.

India can produce about 400 billion kg. of pyrolysis oil from its agricultural residues, which is equivalent to 80 per cent of India's total oil demand for 2012.

Similarly, these residues can theoretically produce 80,000 MW of electric power all the year round through biomass- based power plants. This power is about 60 per cent of the present installed capacity of India. The power plants could either be small scale (500 KW), running on gas produced from agricultural residues, or medium scale (10-20 MW) running on direct combustion of these residues. The technology for this is very mature and there are thousands of such plants running all over the world.

A part of these agricultural residues can also be used via the bio-digester route to produce fertilizer for crops and methane gas to either run rural transport, irrigation pump sets or kitchens. Another stream can also be used to produce fodder for animals. Hence, the residues, if properly utilized, can produce fuel, fodder and fertilizer besides taking care of a huge chunk of India's energy needs. Which stream of residue conversion technology is eventually followed will depend upon the existing market forces. Energy from agricultural residues in India can generate 30 million jobs in rural areas.[iii]

As the demand for energy increases we may see huge tracts of land coming under energy crops like sugarcane for ethanol production or jatropha for producing biodiesel. This can adversely affect food production. These effects are being felt in US where huge acreage under corn has been diverted for ethanol production. Similarly, large tracts of land in Brazil are being directed from food production to growing sugarcane for ethanol production. The use of agricultural residues for energy production is, therefore, the best way to settle the food vs fuel debate.

Japan, Brazil and the United States are increasingly using alternative non-fossil fuels in the transportation sector. In Brazil, for

instance, the mandatory ratio of ethanol with petrol is 24 per cent while in the US it is 10 per cent. Overall, the blend programme has at least two direct benefits. Firstly, it will give a boost to the agriculture sector by stabilizing sugar prices and enhancing buffer stocks to ease worries of factories being burdened with huge stocks. It will also connect farmers in a more inclusive way to the economy, as they would have another outlet for their sugarcane production. And, in the process, it would perhaps spawn the growth of other ethanol-producing crops such as grain sorghum or maize. Secondly, the successful implementation of the programme would encourage the use of renewable energy sources, thus reducing the adverse impact on the environment--especially as the ethanol ratio should, ideally, over time, be raised to a point where the petroleum component is minimized. [iv]

Writing in the New York Times, Elisabeth Rosenthal contends that in Europe, bio-fuel plants are competing with the food supply.[v] Motivated by generous subsidies to develop alternative energy sources. Europe's farmers are beginning to grow crops that can be turned into fuels meant to produce fewer emissions than gas or oil. They are chasing their counterparts in the Americas who have been rising crops for biofuel for more than five years. In March 2007, the European Commission approved a directive that included a "binding target" requiring member countries to use 10 per cent bio-fuel for transport by 2020- the most ambitious and specific goal in the world. Most European countries are far from achieving the target, and are introducing incentives and subsidies to bolster production. As a result, bio-energy crops have replaced food as the most profitable crop in several European countries. Better still, farmers can plant bio-fuel plants on "set aside" fields, land that Europe's agriculture policy would otherwise require be left fallow.

But an expert panel convened by the United Nations Food and Agriculture Organization pointed out that the bio-fuels boom produces benefits as well as trade- offs and risks- including higher and fluctuating food prices. In some markets, grain prices have nearly doubled.

"At a time when agricultural prices are low, in comes biofuel and improves the lot of farmers and injects life into rural areas," said

Gustavo Best, an expert at the Food and Agriculture Organisation in Rome.

"But as the scale grows and the demand for biofuel crops seems to be infinite, we're seeing some negative effects and we need to hold up a yellow light".

Josette Sheeran, the new head of the United Nations world food program, which fed nearly 90 million people in 2006, said that biofuels created new problems. "An increase in grain prices impacts us because we are a major procurer of grain for food: she said. "So biofuels are both a challenge and an opportunity".

In Europe, the rapid conversion of fields that once grew wheat or barley to biofuel crops like rapeseed is already leading to shortages of the ingredients for making pasta and brewing beer, suppliers say. That could translate into higher prices in supermarkets.

"New and increasing demand for bioenergy production has put high pressure on the whole world grain market", said Claudia Conti, a spokesman for Barilla, one of the largest Italian pasta makers. "Not only German beer producers, but Mexican tortilla makers have seen the cost of their main raw material growing quickly to historical highs".

Yet even as the European program begins to harvest biofuels in greater volume, homegrown production is still far short of what is needed to reach the 10 per cent goal.

That could pose a threat to European markets as foreign producers like Brazil or developing countries like Indonesia and Malaysia try to ship their biofuels to markets where demand, subsidies and tax breaks are the greatest. Europe would have to import at least a third of what it would need to reach its 10 per cent biofuels target. It could hamper development of a local industry, while perversely generating new emissions as "queen" fuel is shipped thousands of kilometers across the Atlantic, instead of coming from the farm next door.

Statistics from the Department of Energy, the Renewable Fuels Association in Washington and evidence from Brazil's experience indicate that ethanol from sugar cane is far cheaper to produce than ethanol from corn, a savings that potentially could be passed on to consumers in the form of lower energy bills.

An all-round awareness on jatropha curcas as promising "bio-diesel" plant may have raised hopes among those devoted to evolving alternatives to the fossil fuel. But, the same can't be said about the commercial jatropha cultivators and jatropha oil producers who are crestfallen on soaring seed prices in India.

The jatropha cultivators, also running extraction units, are particularly frightened over rallying jatropha seed prices in recent months. They blame the entry of new "cool" operators who, according to the sources in the jatropha seed processing industry, are offering higher prices for jatropha seeds to be used for raising seedlings, forcing prices to spiral. The sudden entry of so many players at the national and regional level offering to supply jatropha seed materials has driven the market crazy in as much as some people even try to pass off uncertified seeds as "hybrids" at higher prices. The proposed National Bio-Fuel Policy should bring in more clarity on issues concerned with tree- borne oil crops.

Issues include quality planting material, special farm credit programme akin to those available for other agri crops and higher subsidy in setting up drip irrigation for jatropha plantations.

The Central Government has already decided that subject to commercial viability, OMCs (Oil Marketing Companies) will sell 5% of ethanol blended petrol throughout the country with effect from 1.11.2006. The strategy would help stabilise sugar prices. The country's ethanol-blending programme draws inspiration from Brazil, where 23% ethanol -blending is mandatory. The following facts are note-worthy in this regard:

❖ In France ethanol is produced from grapes that are of insufficient quality for wine production.

❖ Over one billion gallons of ethanol are blended with gasoline every year in the US.

❖ In Brazil, pure (100%) ethanol is used in approximately 40% cars. The remaining vehicles use blends of 24% ethanol.

❖ Brazil consumes nearly 4 billion gallons of ethanol annually.

❖ EU has set a reference value of 5.75% for the market share of biofuels in 2010.

❖ Scientists estimate that 10% ethanol in petrol could mean a 30-40% reduction in the carcinogens and 50% reduction in cancer-causing fine particles.

❖ Globally, car manufacturers are already designing vehicles designed to be able to use 85% ethanol.

❖ Ethanol is the only additive to petrol that can reduce the greenhouse effect.

❖ Ethanol is a renewable fuel.

❖ The use of sugar in the production of ethanol can potentially have an enormous impact on the dwindling sugarcane.

❖ Ethanol provides energy security.

Agri-Business

In India, Rs. 58,000 crores of fruit, vegetables, pulses and grains, or a third of total food produce, is wasted each year for want of storage and marketing facilities. Of the produce that survives, very little is processed, compared to the situation in Malaysia, the Philippines, Brazil and Thailand. It is here that the entry of organized retail can make a huge difference.

It would lead to the creation of large, efficient cold storage, which, in turn, could transform the character of the food processing industry by enabling it to deal in large volumes. At present, food processing is dominated by the small-scale sector, which is not equipped to deal either in volumes or variety of produce. In the absence of storage systems, these units do not operate round the year, yet, it is remarkable that this sector employs about 1.5 million people. It is often overlooked that the Indian agriculture sector is

almost totally private. However, it belongs to the realm of the unorganized sector and as such lacks both capital and organizational skills to maximize returns. What is needed is to create a mutually beneficial synthesis between organized private capital as represented by, say, ITC or Wal- Mart and the amorphous agrarian sector. The government should play its legitimate role as an honest broker to help both parties work out an advantageous deal for all concerned. This could be done by ensuring that there are no job losses, which food prices are both remunerative and stable, and the small agriculturist is saved from suicidal debt.

From the total arable land in India of 18.4 crore hectares, fruit and vegetables contribute 15 crore tonnes with 70% being vegetables and 30% fruits. The total market size for fruits and vegetables is Rs. 1,13,000 crores. Of this, wastage is as high as 30-40% largely because of poor post-harvesting infrastructure like storage, cold chains, etc. India is the largest producer of horticulture items in the world and sadly only less than 2% of this is being processed.

India's potato production is estimated to be about 25 million tonnes cultivated over 13 million hectares, making India the 3rd largest producer of potato. However, the per capita consumption is 18 kg. versus the world's average of 45 kg. As far as processed potatoes are concerned less than 2% is processed in the organized sector.

The Merino Group, a Rs. 250 crore organization, has nearly four decades of association with the agri industry, starting with establishment of cold storage for storing potatoes produced in and around Hapur. The group has set up tissue culture laboratory at Bhimtal (Uttarakhand) and Hapur (UP) for development and multiplication of potato seeds and other variety of seeds. This is at the centre of the best potato growing area in India.

It has organized system of contract farming for producing select variety of potatoes. About 1000 acres of land is under cultivation in the current year through cooperative farming method benefiting 400 to 500 farmers. The network will be enlarged in the next year to reach 1000 farmers. Post-harvesting management, modern cold storage techniques and comprehensive agronomy

support is being extended to these contract farmers ensuring quality output consistently.

It has also upgraded cold storages ensuring farm fresh potatoes all round the year with no compromise on the quality of potatoes during off season. State-of-the -plant and machinery, and process technology for potato processing has been imported from the Netherlands, the world leaders. The new product from Merino, Vegit Aloo Mash, is cooked, meshed and dried potato flakes sized to required form and density. The product has been available in the industrial segment from past one year. Vegit is now entering the retail market with 120 gram and 400 gram packs. The packs have a shelf life of one year. This makes it the first company in India to enter the retail market for potato flakes under cool and dry condition.

❖ North India is the base of FMCG players like Nestle, Dabur, Pepsi, Coca-Cola and Cremica, but the hinterland is where the next big thing will happen. Bharti has planned a joint venture with EL. Rothschild for export of fresh produce and a tie-up with retail giant Wal-Mart for front and back-end retail operations. Reliance too has plans to set up a network of rural business hubs starting with Punjab and Haryana, firming up their agri- business plans for the region.

The region also has, apart from private companies, state government bodies like Punjab Agro Industries Corporation and Himachal Pradesh Horticultural Produce Marketing and Processing Corporation Ltd. popularly known as HPMC, marketing fresh and processed fruits. HPMC, for instance, supplies apple concentrate to brands like Appy Fizz. The north also has the largest and second largest producer of wheat (Uttar Pradesh and Punjab), the biggest basmati rice producer (Haryana), and the largest pulses, sugarcane, potato, and tobacco producer (Uttar Pradesh). It might be lagging behind the south in fruit processing, but then, it is the leader in frozen vegetables and ready-to-eat categories. Kohinoor Foods, formerly Satnam Overseas, has rice processing units in Punjab, Haryana and Delhi. The company supplies to retailers in the USA, the UK, France, Canada and West Asia, for their private labels as well as under its own 'Kohinoor' brand. "We plan to increase capacities of our ready-to-eat plants from 50,000 to 1 lakh meals a day, and of our basmati rice plant from 62 metric tones (mt) per hour to 70 mt. per hour", says Kohinoor Foods CFO Rajiv Mangla.

For Delhi-headquartered DCM Shriram Consolidated Ltd. (DSCL), 60% of the revenue comes from agri-business. The company's presence in agri-business covers agricultural inputs, outputs, distribution and services. DSCL manufacturers and supplies agri- inputs like urea, seeds and pesticides. It has two sugar processing plants in Ajbapur and Rupapur in Uttar Pradesh. DSCL also has a rural retailing initiative, Hariyali Kisan Bazar, which provides agri-inputs, petrol and diesel, and services like credit, to the farming community. There are over 6,000 Hariyali Kisan Bazars in the country.

They might be relatively new entrants, but the Bharti Group and Reliance are moving in with some plans for the region. Field Fresh Foods, Bharti's JV with the Rothschilds, sources vegetables from Uttarakhand and fruits from Punjab and UP. Having sent trial shipments of grapes, mangoes, okra, bitter gourd and chillies to Japan, EU, Russia, West Asia and Hong Kong, Bharti is a scaling up collaborative farming over 5,000 acres of land in Punjab, Rajasthan and Uttarakhand, with plans to upscale exports to these countries.

Last year, Reliance negotiated a 'universal land use' license with the Punjab government to set up more than a dozen rural business hubs (RBHs) in the state, involving acquisition of about 1,000 acres. The group would invest Rs. 1,000 crore to kickstart the rural business hub project in Punjab. Reliance will procure and even processes in some cases, farm produce at the RBHs, set up warehouses and retail products and services to the farming community as well as provide extension services like farm advice.

Having designated India as its farm produce hub for Asia, Pepsico is planning to add to its farm repertoire in India, it plans to grow barley in Rajasthan, Haryana and Punjab, while, it already cultivates citrus fruits, potatoes and seaweed in the country. The Gurgaon-headquartered Pepsico India also plans to increase the capacity at its Punjab citrus fruit initiative and restart tomato processing operations.[vi]

Financial incentives from Himachal Pradesh and Haryana and liberal policies of the Punjab Government have helped attract big players like Pepsi, Satnam Overseas, Nestle and Dabur to this region. In addition, a large number of local brands like Bakeman's, Verka,

Vita and Cremica have been trying to strengthen their hold over the market. Various initiatives from the Punjab and Haryana governments to set up food parks, agro-export zones and state support to apple growers by the Himachal Government have been instrumental in strengthening the food processing industry. Towns like Ludhiana, Jalandhar, Solan, Baddi, Faridabad, Karnal and Ambala are now fast developing as centres of the processing industry.

According to the Federation of Indian Chamber of Commerce and Industry (Ficci) estimates, at present 20-25 per cent of fruit, vegetables and milk is processed in the North region as against around 10 per cent at the national level.

Apart from suitable policies of the state and Central governments, the rich urban and semi-urban markets of Punjab, Haryana and Himachal Pradesh and surplus production of vegetables, milk and fruits like apple have encouraged national and international players to focus on the region.

The Central Government has declared food processing a priority area and granted various tax exemptions for the sector. The government has announced tax exemptions on agro-processing units and full exemption of excise duty on dairy machines to promote this sector. Further, all processed fruits and vegetable products have been exempted from the central excise duty.

The following facts and figures regarding the Indian food processing industry are noteworthy:

- The Food Processing Industry is estimated to grow at 9-12% on the basis of an estimated GDP growth rate of 6-8%, during the current plan period.
- Value addition of food products is expected to increase from the current 8% to 35% by the end of 2025. Fruit and vegetable processing which is currently around 2% of total production will increase to 10% by 2010 and to 25% by 2025.
- The industry employs 1.6 million workers directly. The number of people employed by the industry is projected to grow to 37 million direct and indirect job workers by 2025.

❖ Marine products export was the single largest constituent of the total exports of the processed foods contributing over 40% of the total processed food exports.

❖ Five-year tax holiday for new food processing units in fruits and vegetable processing along with other benefits in the Budget has bolstered the Government's resolution of encouraging growth in this sector.

❖ India is the largest producer of milk in the world. Milk and milk products account for a significant 17% of India's total expenditure on food and the popular milk products are cheese, butter, ghee, dairy whiteners and ice- creams.

❖ The Indian snack food market comprising bakery products, ready to eat mixes, curries, chips, namkeens and other processed foods is large, diverse and dominated by the unorganized sector.

❖ The total size of the Indian snack food market is at an estimated over 400,000 tonnes in volume terms and over Rs. 100bn in value terms, growing at over 10% for the last few years. The three largest consumed categories of packaged foods are packed tea, biscuits and soft drinks. [vii]

The Plantation Sector Economy

Coconut

While overall coconut production has been stagnating at around 12 billion nuts a year since the early 1990s, the country's average productivity has not gone beyond about 7,000 nuts per hectare harvested way back in the early 1950s. And this is despite the existence of the Coconut Development Board since 1981 and the technology mission on coconut launched in 2001-02.

The genesis of the misfortune can be traced to the failure to capitalize on the diversified applications that this plant leads itself to. Its cultivation and processing has remained by and large copra centric. The use of its oil as a cooking medium has not spread beyond Kerala and its adjoining areas. The industrial use of coconut oil, which could have sustained its cultivation, has been on the decline, largely due to the availability of relatively cheaper alternatives. Various other oils extracted from the seeds of wild plants, as also rice bran oil, have

replaced the relatively high-priced coconut oil in most industrial applications. The use of coconut oil in soap-making, for instance, which was almost 25 percent at one stage, has now dropped to a mere 5 per cent.

Besides, heavy imports of palm oil at deliberately-kept low import duties have provided tough competition to coconut oil in terms of prices. And where other coconut products and their possible commercial uses are concerned, private investment has not come to the desired extent to exploit the potential. Nor has enough been done to expand their export potential.

Besides, there are problems even in the marketing of coconut products. Their prices, too, tend to be determined by the prices of coconut oil, which fluctuate widely, depending on the demand -supply equation and competition from other oils. Though copra is now allowed to be traded in the futures market, which has not led to either price stability or price discovery as the government fixes the minimum support prices.

What is needed under the circumstances is greater investment in research and development, especially in diversification of coconut use. The reduction in costs and improvement in the quality of coconut-based products is a must to increase their demand. Private investment will come only if better technology is generated in the public sector for the production of innovative coconut-based products at competitive costs.[viii]

The Coir Board is now eyeing the North East as potential area for the promotion of coir industry. The Board feels that coir products have ready market in the North-East. The Centre has approved Rs. 1,455 crore for modernization and technology upgrading in the coir sector during the 11th Plan. In the Budget 2007, provision of Rs. 22.50 crore has already been made. Of Rs. 1,455 crore, at least 10% will come to North East. We will invest around Rs. 145 crore in the North East during the 11th Plan. In 2006-07, coir products export was worth Rs. 605 crore. In 2005-06, coir products worth Rs. 508 crore were exported.

The Coir Board is trying to create at least 5,000 employments in the coir sector in the North- East. There is a ready market for coir products in the region. The per hectare productivity of coconut in Assam is higher than Kerala. However, Assam is yet to have a robust

coir industry. In terms of productivity, Assam produces around 7,700 coconuts per hectare, while in Kerala it is around 5,500. The US and European countries are becoming major buyers of coir products. The board has earmarked Rs. 42 lakh for the setting up of coir fibre unit at Nalbari in Lower Assam. As we have a substantial presence in the international arena, we are now devising ways and means for the expansion of domestic market. [ix]

Cashew

The Cashew Export Promotion Council of India (CEPCI) will be formulating good manufacturing practices for the cashew industry to meet the world standards. This will help the industry achieve zero defects by December 2007. Intensified programmes will be implemented for technological upgradation and modernization of the industry in order to meet the buyer's expectations. Packaging and presentation will be improved and enhanced to add value. CEPCI will work towards quality certification and rating for cashew exporters. It will strive to increase the country's market share and to regain dominant position in the world market. It will aim at number one position in production, processing, imports and exports. CEPCI visualises export of 2.75 lakh tones of cashew kernels by 2020 against the current 1.15 lakhs tonnes. This requires Indian raw nut production to be increased to 1.9 million tonnes, while mentioning imports at 0.50 million tones. The council has requested the Centre to ensure production at these levels.

According to projections, this will translate into employment generation of 850 million mandays for 1.25 million workers and sustainable horticulture opportunities for one million farmers.

The number of countries to which cashews are exported shall be increased from 60 to 125. CEPCI will target a compounded annual growth rate in exports to 20 'focus' countries in the new markets being explored. It will strive to ensure that at least 20 per cent of the exports will be value-added and marketed under the 'Made in India' brand.

CEPCI will also strive to enhance productivity and competitiveness in the cultivation and post-harvest technology of

raw cashew nuts by motivating all departments under the Ministry of Agriculture at the Central and State levels.

Tea

With tea prices firming up in the first quarter of 2007, the Indian tea industry is gaining confidence about an improved financial showing. The industry needs at least five years of good tea prices if it has to improve its profitability. The year 1998 was the last good year for tea and, while costs have increased by Rs. 18-20 a kg, sale prices had dropped by around the same amount leaving the industry in a quandary.

Erratic rainfall and warm temperatures have affected the crop in the January- March, 2007 period with the garden in North and South India showing drop in production.

In percentage terms, the drop has been sharper in North India, which has reported a 14.3 per cent fall, while in the South; the drop is of the order of 8.5 per cent. However, in the wake of increased domestic consumption, this is translating into good news for the tea companies.

The industry had already expressed optimism of turning around in 2006 and maintaining the trend in the following years. The Indian Tea Association (ITA) had earlier said in a status paper that the industry should now perform well and resume its growth momentum after seven years of recession, between 1998 and 2005.

Prices are expected to firm up further once the Special Purpose Tea Fund takes off. With replantation activities taking off, a crop shortfall is foreseen.

Between January and April, 2007 tea prices increased by Rs. 1.52 a kg in the North Indian auctions touching Rs. 65.04 a kg. While in the South Indian auction centres the increase was sharper - by Rs. 4.4 a kg.- quoting at Rs. 54. All India prices averaged at Rs. 61.41 against Rs. 58.4 a kg in the first four months of 2006. Lesser availability coupled with rising domestic demand, estimated to be increasing at around 3.3 per cent annually, was leading to a firming up of prices. A sustained campaign by the Tea Board has helped the industry hold on its own in the face of competition from other

beverages. This year, domestic tea consumption is estimated at about 825 million kg. [x]

The Central Government has decided to take over the management of three sick tea gardens in West Bengal--Sikarpur, Bandarpur and Raipur-- by invoking Section 16D of the Tea Act, 1953. In the last 54 years, the GOI has never invoked this section. But the owners of the closed gardens in West Bengal are not taking any initiative to reopen the gardens. The GOI will first take over the management of these tea estates and subsequently find buyers for them through open bid.

Section 16D of the Tea Act, 1953 empowers the Central Government to assume the management or control of a tea undertaking or tea unit under certain circumstances. This section can be invoked if:

- The tea unit has made losses in three out of five years preceding the year in which such opinion is formed.
- Average yield has been lower than the district average yield by 25% or more.
- Default in payment wages, PF dues, land rental, excise duties or any other obligatory dues.
- Managed in a manner highly detrimental to the tea industry or public interest.

Coffee

For the 11th Plan period, the Coffee Board aims to address issues like making the Indian Coffee growers sustainable in the long run by introducing a slew of measures even while focusing on boosting the output and domestic consumption. The output could touch 3.1-3.2 lakh tones by the end of the 11th Plan as new areas to an extent of 25,000 hectares would come into production over the next few years. "Through proper promotional efforts, it is possible to double the domestic coffee consumption in the next decade".

Further, banks had recently decided to stop support the Special Coffee Term Loan (SCTL) package further. The loan and

interest component under SCTL exceeds Rs. 1,200 crore and growers had urged the Government to bring down this component by 50 per cent and reschedule the rest for 10 years with a lower rate of interest.

In a bid to protect coffee growers from the vagaries of blossom showers and monsoons, the Government proposes to come out with a weather-linked insurance scheme soon.

The pilot scheme that was launched in few districts last year was a non-starter for various reasons. The Agriculture Insurance Corporation (AIC) has recast the entire scheme by changing all parameters and the new scheme would be launched soon.

Growers will be covered against three triggers under the new scheme- failure of blossom showers, backing showers and excess monsoon rains, among others. Growers covered for these three or any of these triggers would be eligible for immediate payout. Premiums for the new scheme range from Rs. 600 Rs. 700 per hectare to Rs. 4,000 Rs. 5,000 per ha.

As the premiums are on the higher side, the Coffee Board has suggested extending subsidy of 50 per cent for the premiums under the new scheme. About 46 different coffee growing zones have been identified as individual units for the scheme and rain gauges in these zones would be monitored by the public sector agencies.

The Andhra Pradesh Government has decided to encourage the growth of organic coffee in the agency areas of the state in a big way. The help of the Coffee Board has been sought for this initiative, which helps tribal families earn better. The organic coffee grown here is known for its quality abroad. Already 80,000 acres of land is under organic coffee cultivation in the Visakhapatnam agency areas. Now, the state government has come up with a proposal to add another 60,000 acres at a combined cost of Rs. 148 crores.

While the Coffee Board will bear Rs. 40 crores, Central assistance will be of Rs. 36 crores and the local farmer's contribution through "Shrama danam" and the state government inputs will provide the remaining Rs. 72 crores.

The government will ensure that each tribal - family will get to grow at least one acre of plantations. The project will be supervised together by the ITDA and the Coffee Board. The Board will take up marketing of the niche product and the coffee processing will also be uniform for the benefit of growers.

As many as 1.20 lakh tribal families inhabit the Vishakha agency areas and the district boasts of large scheduled area tracts. Each tribal family is estimated to get anywhere between Rs. 10,000 to Rs. 40,000. The Vishakha agency area is ideal for growing horticultural crops, spices and herbal plants as well. In fact, pepper and turmeric will be grown as part of inter-cropping in the plantation fields. [xi]

Summing Up

A growth rate of 9.4 per cent in 2006-07 is great news, but the challenge lies in keeping it going. There is always a risk of its becoming stuck up if agriculture continues to remain a laggard- it grew by just 2.7 per cent in the previous fiscal. Some economists argue that since agriculture contributes just 18.5 per cent of India's gross domestic product, its slow growth will not act as a drag on the entire economy. They are mistaken. Rural India still accounts for 60 per cent of the country's population, and can vote governments out of power if it perceives that growth is not helping people at large. That could upset policy momentum and business sentiment. Besides, the participation of a large number of people in the market would stabilize industrial demand over time, creating the right climate for investment.

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AUTHOR'S PROFILE

A gold medalist in M.A. (Political Science) from Patna University, Dr. C. Ashokvardhan had been a lecturer in Ranchi College for a brief spell and subsequently served Patna College for about 5 years. HRD in Bokaro Steel Plant represents his field of doctoral and postdoctoral research. His doctoral dissertation has been published by the SAIL: Bokaro Steel Plant.

Dr. Ashokvardhan belongs to the 1980 batch of the IAS and to the Bihar Cadre. He has served in various capacities in the Government of Bihar and his exclusive revenue & land reforms postings include: Settlement Officer, Dhanbad; Additional/ Special Secretary in the Department of Revenue & Land Reforms; Director, Land Records & Survey, Bihar; Additional Member, Board of Revenue, Bihar and Director, Consolidation Bihar, spanning a length of about 15 years exclusively in this sector. He has covered the country extensively as a member of numerous expert groups set up by the Ministry of Rural Development, GoI/ National Commission for SCs & STs and his papers and presentations carry the scent of ground realities. He has had training stint abroad in Thailand, China and the U.K.

Dr. Ashokvardhan is a creative writer having published quite a few collections of his poems. He has published extensively on various themes and has been a recipient of various awards from the Ministry of Steel, Ministry of Rural Development, Ministry of Personnel and Public Grievances and Bureau of Police Research and

Development, Ministry of Home, GoI. And yet his primary interest lies in revenue and land reforms. His publications in this sector include:

1.	Land Reforms in Kerala: the Myth and the Reality	National Institute of Rural Development, Hyderabad	1992
2.	Land Records Management in 14 States of India	-Do-	1998
3.	Tenancy Reforms Re-visited	LBS National Academy of Administration, Mussoorie	2000
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10.	Attacking Rural Poverty through Farm Productivity	-Do-	2007
11.	Land Policies for Rural Development	-Do-	2007

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