

## **Revival of Indian agriculture for sustainable development : A global prespective**

**P.K. MANOJ**

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See end of the article for authors' affiliations

Correspondence to :

**P.K. MANOJ**

Department of Applied Economics, Faculty Techno-Management, Cochin University of Science and Technology, KOCHI (KERALA) INDIA

### **Key words :**

Sector-wise Composition of GDP, High-tech agriculture, Subsidies, Agricultural Productivity, agricultural exports

**I**mbalance among the different sectors of Indian economy in respect of their relative contribution to the GDP of the nation has been an issue of utmost significance for the last so many years. The situation is worsening year after year, with the share of agriculture declining year after year, while that of services growing constantly and that of industries remaining rather stagnant. In the peculiar situation of India, thus the much desired balance between “Farm, Factory and Services”, is seriously affected. As per the latest statistics (2007), agriculture accounts for just 18.50% of the GDP, while that of industries is 26.40% and the balance more than 55.10% goes to services. It may be noted that the share of agriculture has almost halved from its position in 1990 when it was about 34%. Thus, the need of the hour is to increase its share to 30-35 % level for balanced economic development. Though the industrial sector has been facing the problem of stagnancy over the last 25 years or so with its share hovering around 25-25%, of late, its position rather satisfactory as there are very clear signs of industrial revival. However, the case of agriculture still remains pathetic and that too increasingly year after year. In the above context, this paper seeks to develop a few pragmatic and realistic strategies for enhancing the productivity of Indian agriculture and hence to ensure balanced and sustainable economic development of the nation.

Indian economy has been witnessing a number of radical changes in the ongoing era of economic deregulation initiated in the early nineties. In general, there has been an overall progress in the economy as is evident from the reasonably good macroeconomic stability, surging foreign exchange reserves, favourable balance of payment situation and reasonably good GDP growth rate. Above all, there exists a very strong, resilient, dynamic and healthy banking sector which is one of the best among all the emerging economies. Furthermore, as opposed to the prolonged stagnancy in the

industrial sector in general (and manufacturing sub-sector in particular) over the last one decade or more, of late there have been clear indications of an industrial revival primarily propelled by the buoyant manufacturing sector. However, in spite of all these favourable outcomes of economic deregulation in India, there are certain very disappointing aspects also. Of these, one of the most chronic problems that the economy faces is that of a constantly declining performance of the agricultural sector causing imbalance between the different sectors and hence adversely affecting the overall economic development. This in turn has resulted in many other problems like, growing unemployment, migration from rural to urban areas, widening of rural-urban divide, problems of fast urbanization, growing marginalization and deprivation of the poor from the developmental process and so on. These adverse effects of economic deregulation may result in the growth process becoming unsustainable and hence may hinder the fast economic development of the nation. As already noted, the most distinguishing aspect of the above problems is the crisis faced by the Indian agriculture sector. Agricultural crisis may be because of different reasons and the implications of the same also are quite diverse and also far reaching. The fact remains that about 50 per cent of the population of this developing country still depends on agriculture for livelihood, either directly or indirectly, even though the contribution of agriculture to the nation's GDP is rather low and is declining year after year.

### **Analytical significance:**

In a developing nation like India, wherein majority of the population still depends on agriculture for livelihood, it is imminent that this sector should grow in tandem with the other major sectors. There should be a balance between the three major sectors *viz.*, services, industries and agriculture. This in turn can bring

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about fast economic development by reducing the disparities between the urban and rural areas, providing employment to the rural masses, mitigating urbanization problems by reducing migration to the urban areas and so on. In this context, a study of the problems of Indian agriculture for suggesting suitable remedial strategies assumes significance, particularly in view of the globalization pressures sweeping across the globe.

#### **Objectives :**

- To study the present status of agricultural sector in India, from a global perspective,
- To analyse the major causes of agricultural crisis in India, and
- To suggest a few macro level strategies for revival of Indian agriculture, for the sustainable economic development of the nation.

#### **Organization :**

Part – I of the paper discusses the status of the agricultural sector in India from a global perspective, and its relative position in the sectoral composition of the GDP. Part – II gives the major causes behind the Indian agricultural crisis. Part – III suggests a few macro-level strategies for the revival of Indian agriculture for sustainable development of the nation.

#### **Part – I**

##### ***Agricultural sector in India: global perspective:***

The imbalance between the different sectors of Indian economy in respect of their relative share to the national GDP has been an issue of utmost significance for the last so many years. The situation is worsening year after year; with the share of agriculture declining significantly every year, while that of services growing constantly and that of industries remaining rather stagnant.

##### ***India in the agricultural front: a typical “Transforming Country” in the world:***

As per the latest World Bank’s Development Report (2008), *Agriculture for Development*, various countries across the world can be broadly categorized into three groups depending on how they rely on agriculture as a source of growth and an instrument for poverty reduction. Accordingly, (i) considering the share of agriculture in aggregate growth over the past 15 years’ period (1990-2005), (ii) the current (2005) share of total poverty in rural areas, and (iii) using a \$USD 2-a day poverty line, countries in the world could be broadly classified into three broad groups. Box 1.1 and Table 1.1 depicts the characteristics of these three groups of countries.

**Box 1 :The three country types, 2005**

| Agriculture-based Countries  | Transforming Countries  | Urbanized Countries  |
|--|---|--|
| Agriculture is the major source of growth, accounting for 32 % of GDP growth on an average – mainly because agriculture is a large share of GDP – and most of the poor are in rural areas (70%) This group of countries have 417 million rural inhabitants, mainly in Sub-Saharan countries. 82% of the rural Sub-Saharan population lives in agriculture-based countries. (India was in this group in 1965-1994 period. But, from 1995 it is in the group of “Transforming Countries”). | Agriculture is no longer a major source of economic growth. It contributes an average of only 7% to GDP growth, but poverty remains overwhelmingly rural (82% of all poor). This group has more than 2.2 billion rural inhabitant. 98% of the population in South Asia, 96% in East Asia and Pacific and 92% in the Middle East and North Africa fall under this category. [Typified by China, India, Indonesia, Morocco, and Romania. Others include, Vietnam, Sri Lanka etc.] | Contribution of agriculture to economic growth is quite less, 5% on an average. Poverty is mostly urban. Still, rural areas have 45% of the poor. Agribusiness and the food industry and services account for as much as one-third of GDP. This group has 255 million rural inhabitants, mostly from countries in Latin America and the Caribbean and many in Europe and Central Asia. 82% of the rural population in both regions are in urbanized countries. [eg. Brazil, Chile, Philippines, Russia, Peru etc.] |

[Source: Compiled from, World Development Report 2008, *Agriculture for Development*, The World Bank, Washington, DC, 2007, pp.4-5]

The World Development Report 2008 points out that countries follow evolutionary paths that can move them from one country type to another. For instance, China and India moved from the agriculture-based to the transforming group over the past 20 years. Accordingly, India was an agriculture-based country during the period 1965-1994. But, afterwards it continues to be a typical country in the group of transmission countries. Indonesia has gravitated its position within the group of transforming countries during the period (1970-1996) and is approaching towards the group of urbanized countries. Brazil has already moved from the transforming group to the group of urbanized countries during the above period (1970-1996).

**Table 1 : Characteristics of the three groups of countries (2005)**

| Particulars                                       | Agriculture based | Transforming | Urbanized |
|---|-------------------|--------------|-----------|
| Rural population (millions), 2005                 | 417               | 2220         | 255       |
| Share of population rural (%), 2005               | 68                | 63           | 26        |
| GDP per capita (2000 USD), 2005                   | 379               | 1068         | 3489      |
| Share of agriculture in GDP (%), 2005             | 29                | 13           | 6         |
| Annual agricultural GDP growth, 1993-2005 (%)     | 4.0               | 2.9          | 2.2       |
| Annual non-agricultural GDP growth, 1993-2005 (%) | 3.5               | 7.0          | 2.7       |
| Number of rural poor (millions), 2002.            | 170               | 583          | 32        |
| Rural poverty rate, 2002 (%)                      | 51                | 28           | 13        |

[Source: Ravallion *et al.*, 2007; World Bank 2006y., in Development Report 2008, *Agriculture for Development*, The World Bank, Washington, DC, 2007, p.5]

***Agriculture: a strong agent for sustainable development:***

***Heterogeneity of the Rural world: Delicate task of a balancing policy:***

The report further highlights the fact that heterogeneity – both economic and social – is a defining characteristic of the rural areas. Large commercial farmers coexist with smallholders. This diversity permeates the smallholder population as well. Commercial smallholders deliver surpluses to food markets and share in the benefits of expanding markets for the new agriculture of high-value activities. However, many such smallholders are just in subsistence farming, mainly due to low asset endowments and unfavourable contexts. Consuming most of the food they produce, they participate in markets as buyers of food and sellers of labour. Further, heterogeneity is found in the rural labour market as well. Here, there are many low-skill, poorly remunerated agricultural jobs. Besides, there are a small number of high-skill jobs that offer workers reasonable income that enables them to get rid of poverty. This situation exists mostly in the rural non-farm economy. Though it lifts some of the rural poor out of poverty, it takes the others to urban slums and continued poverty. This pervasive heterogeneity that exists in agricultural and rural society as detailed above has got deep implications for public policy in using agriculture for development. In fact, differentiated policies have to be designed so as to bring about desired outcomes. However, balancing attention to the favoured and less-favoured subsectors, regions, and households is indeed a difficult task for the policy makers.

***Agriculture has got strong development potential, but yet to be used properly:***

Across all country types as discussed above, agriculture growth has got special powers in reducing poverty. Cross country experiences point as follows :

GDP growth originating in agriculture is at least twice as effective in reducing poverty as GDP originating outside agriculture. It is 3.5 times more for China and 2.7 times for Latin America.

GDP growth originating from agriculture is 4 times more effective in raising income of the poorest of the poor than GDP growth originating without this sector

Rapid agricultural growth – in India following technological innovations (the diffusion of high yielding varieties of seeds i.e. HYV seeds) and in China following institutional innovations (the household responsibility system and market liberalization) – was accompanied by major declines in rural poverty. In Ghana, rural households accounted for a large share of a steep decline in poverty induced in part by agricultural growth

[Source: Compiled from, World Development Report 2008, *Agriculture for Development*, The World Bank, Washington, DC, 2007, p.6]

Further, agriculture can be the lead sector for overall growth in the agriculture-based countries. Firstly, in many of these countries food remains imperfectly tradable because of high transaction costs and the prevalence of staple foods that are only lightly traded. Most of these countries must largely feed themselves. Secondly, for these countries comparative advantage in the tradable sub-sectors will still lie in primary activities (agriculture and mining) and agro-processing for many years because of resource endowments and the difficult investment climate for manufacturers. Because of the above reasons, for many years to come, growth strategy of these countries have to be ideally focused on making agriculture as the prime move for development. In spite of this fact, agriculture has been vastly underused for development. Failure to provide adequate attention to agricultural growth (evidenced by declining share of agriculture in GDP and rising share of industries and services). This vulnerable situation exists in many of the countries in the world, mostly in agriculture-based and transforming economies,

which makes their economic growth process highly unsustainable. In short, sustainability warrants increased attention on agricultural growth for these countries. In fact, public spending on agriculture is lowest in the agriculture-based counties, while their share of agriculture in GDP is the highest (Table 2 and 3). This points to serious apprehensions regarding the sustainability of their growth.

**Table 2 : Agricultural GDP as a percentage of total GDP (Percentage)**

| Year | Agriculture-based | Transforming | Urbanized |
|------|-------------------|--------------|-----------|
| 1980 | 29                | 24           | 14        |
| 2000 | 29                | 16           | 10        |

[Source: Compiled from, World Development Report 2008, *Agriculture for Development*, The World Bank, Washington, DC, 2007, p.7]

**Table 3 : Public spending on agriculture as a percentage of agricultural GDP (Percentage)**

| Year | Agriculture-based | Transforming | Urbanized |
|------|-------------------|--------------|-----------|
| 1980 | 04                | 10           | 17        |
| 2000 | 04                | 11           | 12        |

[Source: Same as Table 2 above.]

### ***Emergence of new opportunities – Need for redefining the policies:***

During the last two decades or more, the world of agriculture has changes dramatically. Dynamic new markets, far-reaching technological and institutional innovations, and new roles for the state, the private sector, and civil society all characterize the emerging scenario of agriculture. The new agriculture that is emerging will be one led by private entrepreneurs in extensive value chains linking producers to consumers and including many entrepreneurial smallholders supported by their organizations. The emerging vision of agriculture for development redefines the roles of producers, the private sector and the state. Production is mainly by smallholders, who often remain the most efficient producers, especially when supported by their organizations. World Development Report 2008 suggests the following effective instruments in this regard.

### ***Increasing the access to assets:***

Household assets are major determinants of the ability to participate in agricultural markets, secure livelihoods in subsistence farming, compete as entrepreneurs in the rural non-farm economy, and find

employment in skilled occupations. Three core assets in this regard are (i) land, (ii) water, and (iii) human capital, which includes education and health. Education is the most valuable asset for rural people to pursue opportunities in the new agriculture, obtain skilled jobs, start businesses in the rural non-farm economy, and migrate successfully. Similarly, better health would ensure dividends in the form of productivity and welfare of human beings.

### ***Making smallholder farming more productive and sustainable:***

One of the most important agendas for agriculture for development that is capable of getting rid of poverty is that of improving the productivity, profitability and sustainability of smallholder farming. For this, the following six policy instruments have been suggested by the world bank: (i) improve price incentives and increase the quality and quantity of public investment, (ii) make product markets work better, (iii) improve access to financial services and reduce exposure to uninsured risks, (iv) enhance the performance of producer organizations, (v) promote innovation through science and technology, and (vi) make agriculture more sustainable and a provider of environmental services.

### ***Moving beyond farming: a dynamic rural economy and skills to participate in it:***

(i) Creation of rural employment: With rapid rural population growth and slow expansion in agricultural employment, creating jobs in rural areas is a huge and insufficiently recognized challenge. (ii) Providing safety nets: Another imminent need for the emerging scenario is that of providing social assistance to the chronic and transitory poor which in turn can increase both efficiency and welfare.

### ***Indian Agricultural Sector: Falling performance is a matter of serious concern:***

The performance of agriculture sector in India has been quite disappointing through out the post-independence period as is evidenced from the constantly falling share of agriculture to the overall GDP of the nation. In respect of annual growth rate in GDP also, the position of agriculture has been very poor – the least impressive of the three major sectors. Tables 4, 5 and 6; Fig.1 are self-explanatory in this regard.

In the peculiar situation of India, primarily because of the declining performance of agricultural sector, the much desired balance between the three major sectors (*viz.*, industries, services and agriculture) has been seriously affected. This imbalance is growing year after

| Table 4 : Pattern of sectoral composition of GDP (at factor cost) in India |             |          |          | (Percentage) |
|--|-------------|----------|----------|--------------|
| Financial year   | Agriculture | Industry | Services | Total GDP    |
| FY 1950-51   | 59.60       | 14.50    | 25.90    | 100          |
| FY 1960-61   | 55.10       | 17.30    | 27.60    | 100          |
| FY 1970-71   | 48.50       | 20.70    | 30.80    | 100          |
| FY 1980-81   | 41.50       | 21.60    | 36.90    | 100          |
| FY 1989-90   | 33.90       | 27.00    | 39.10    | 100          |
| FY 1991-92   | 26.70       | 31.30    | 42.00    | 100          |
| FY 2002-03   | 21.90       | 25.90    | 52.20    | 100          |
| FY 2003-04   | 22.20       | 25.80    | 52.00    | 100          |
| FY 2004-05   | 20.80       | 26.00    | 53.20    | 100          |
| FY 2005-06 <sup>QE</sup>   | 19.90       | 26.10    | 54.00    | 100          |
| FY 2006-07 <sup>RE</sup>   | 18.50       | 26.40    | 55.10    | 100          |

Source: (1) *Economic Survey* (various years till 2006-'07) Ministry of Finance, Govt. of India.

(2) Statistics of Central Statistical Organization (CSO), Govt. of India

[Note: QE: Quick estimates, RE: Revised estimates.]

| Table 5 : Annual average growth rates (at constant prices) of agriculture |                         |                              | (Percentage) |
|---|-------------------------|------------------------------|--------------|
| Financial year / plan period  | Overall GDP growth rate | Growth in agriculture sector |              |
| Seventh plan (1985-'90)   | 06.00                   | 03.20                        |              |
| Annual plan (1990-'92)  | 03.40                   | 01.30                        |              |
| Eighth plan (1992-'97)  | 06.70                   | 04.70                        |              |
| Ninth plan (1997-'02)   | 05.50                   | 02.10                        |              |
| Tenth plan (2002-'07)   | 07.60                   | 02.30                        |              |
| FY 2002-03  | 03.80                   | (-07.20)                     |              |
| FY 2003-04  | 08.50                   | 10.00                        |              |
| FY 2004-05 <sup>PE</sup>  | 07.50                   | 00.00                        |              |
| FY 2005-06 <sup>QE</sup>  | 09.00                   | 06.00                        |              |
| FY 2006-07 <sup>AE</sup>  | 09.20                   | 02.70                        |              |

[Source: *Economic Survey 2006-'07*, Ministry of Finance, Govt. of India, p. 159.]

[Note: PE: Provisional estimates, QE: Quick estimates, AE: Advance estimates.]

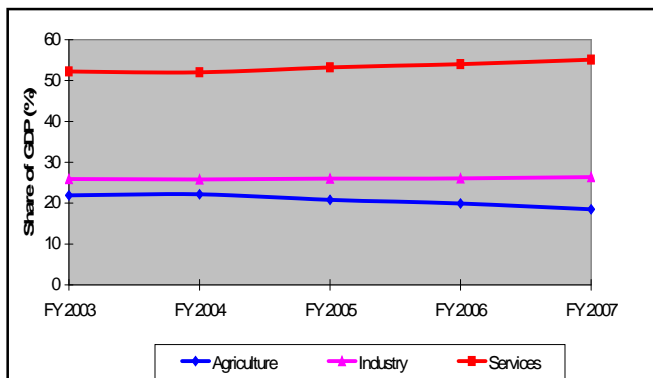
| Table 6 : Average annual growth rates in GDP (Overall) and its major constituents |                         |                         |                         |                         |                         |
|---|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Particulars / sector  | 1981-'82 to<br>1990-'91 | 1992-'93 to<br>2001-'02 | 1992-'03 to<br>2002-'03 | 1997-'08 to<br>2001-'02 | 1997-'08 to<br>2002-'03 |
| GDP (Overall)   | 05.60                   | 06.10                   | 05.90                   | 05.50                   | 05.30                   |
| Agriculture   | 03.80                   | 03.30                   | 02.70                   | 02.00                   | 01.20                   |
| Industry  | 07.00                   | 06.30                   | 06.40                   | 04.60                   | 05.00                   |
| Service   | 06.70                   | 07.80                   | 07.80                   | 08.10                   | 08.00                   |

[Source: Panda, Manoj, (2005), "Macroeconomic Scene: Growth and Equity Perspectives", *India Development Report 2004-'05*, Oxford University Press, New Delhi, First Ed., 2005.]

year. As of FY 2007, agriculture sector accounts for just 18.5% GDP, while that of industries sector and services sector are 26.40 % and 55.10%, respectively. It is evident from Tables 4, 5 and 6; Fig. 1 that the share of agriculture and its annual growth rate have been constantly coming down over the years. But, the share of services has been steadily increasing. The case of industries sector has been rather stagnant. In fact, the share of agriculture has almost halved from its position in 1990 (nearly 34%). Thus, the imminent need is to raise its share to 30-35 % level, for

the balanced economic development. As noted above, the position of agriculture is remaining very disappointing and that too increasingly year after year. Table 5 shows that the growth rate in agriculture sector has been much lower than the overall growth rate throughout the period, except for one year, FY 2003-'04. Table 6 show the annual growth rates of agriculture *vis-à-vis* other two major sectors and also the overall GDP of India.

The average growth rate for the Tenth plan (2002-'07) of 2.30 % and that of the FY 2006-'07 of 2.70 % is



**Fig. 1 : Pattern of sectoral composition of GDP in India (FY 2003 – 2007)**

Source: (As in Table 4 above)

quite lower than the targeted level of minimum 04.00 %. As such, it is imperative that Indian agriculture should grow at almost double the current growth rate. Table 1 to 6 shows that the relative average growth rates of agriculture over the years have been declining and are much lower than those relating to the other two sectors and also the overall GDP.

### **Part – II**

#### ***Agricultural crisis in India: Nature and causes:***

Indian agriculture has been suffering from a number of problems and handicaps which in turn have resulted in the constantly falling performance of the sector vis-s-vis other sectors of the nation. More recently, during the just completed 10<sup>th</sup> Plan (2002-'07) also the performance was quite disappointing. The major causes for the underperformance during the 10<sup>th</sup> Plan have been reported (*Economic Survey 2006-'07*) to be the asymmetric response of foodgrains production to monsoon variability, the repetition of deficient rainfall in the monsoon in 2002, 2004 and 2006. This in turn has led to (i) poor agricultural growth, (ii) reduction in share of agriculture in GDP, (iii) creating inflationary pressure in some primary products, (iv) reduction of potential growth of other sectors by dampening demand. The root causes for this crisis are

discussed below.

#### ***Low yield per unit area, and poor productivity: a regular feature in India:***

Low yield has been a problem of Indian agriculture throughout. For instance, though India accounted for 21.8 per cent of global paddy production, the estimated yield per hectare in 2004-'05 was less than that in Korea and Japan, and just about one-third that in Egypt which had the highest yield level in the reference year. Similar is the case of wheat and other crops. Table 7 and 8 further show that the productivity of Indian agriculture in respect of major crops is very poor though India's share of production and area of cultivation are quite high.

#### ***Technological fatigue: the root cause of Indian Agriculture:***

Technology fatigue is growingly recognized as the root cause behind the slow growth of Indian agriculture. The issue of technology fatigue needs to be addressed properly in order to ensure faster agricultural development of the nation. Technology-related factors include HYV seeds, hybrid seeds, modern tools and techniques, fertilizers, pesticides and so on. As already discussed in the foregoing section, though huge investments have been made in developing technologically superior varieties of seeds (like, HYV seeds, hybrid rice etc.), there has not been the desired level of results since the Green Revolution (1968-1990). In the current scenario, it is important that in the emerging era of knowledge societies, the most modern technologies like agricultural bio-technology (agbiotech) and information technology (IT or infotech or ICT) are used for strategic advantage. Further, equally important is the need for promoting organic farming in India in view of the huge market potential for organic products. Moreover, genetic engineering needs to be promoted further in order to develop pest-resistant, disease-resistant and such other genetically modified (GM) varieties of crops. Above all, considering the socio-

**Table 7 : International comparison of yield of selected commodities (as of 2004-'05)**

| Rice / Paddy |      | Wheat     |      | Maize       |      | Cotton     |       | Major oil seeds |      |
|--------------|------|-----------|------|-------------|------|------------|-------|-----------------|------|
| Egypt        | 9.8  | China     | 4.25 | USA         | 9.15 | China      | 11.1  | Argentina       | 2.51 |
| India        | 2.9  | France    | 7.58 | France      | 7.56 | USA        | 9.58  | Brazil          | 2.48 |
| Japan        | 6.42 | India     | 2.71 | India       | 1.18 | Uzbekistan | 7.98  | China           | 2.05 |
| Myanmar      | 2.43 | Iran      | 2.06 | Germany     | 6.69 | India      | 4.64  | India           | 0.86 |
| Korea        | 6.73 | Pakistan  | 2.37 | Philippines | 2.1  | Brazil     | 10.96 | Germany         | 4.07 |
| Thailand     | 2.63 | UK        | 7.77 | China       | 4.9  | Pakistan   | 7.60  | USA             | 2.61 |
| USA          | 7.83 | Australia | 1.64 |             |      |            |       | Nigeria         | 1.04 |
| World        | 3.96 | World     | 2.87 | World       | 3.38 | World      | 7.33  | World           | 1.86 |

[Source: *Economic Survey 2006-'07*, Ministry of Finance, Govt. of India, p. 160.]

**Table 8 : India's position in production and productivity of major crops in the world**

| Crops     | India's share (%) |            | India's rank |            | Productivity |      |
|-----------|-------------------|------------|--------------|------------|--------------|------|
|           | Area              | Production | Area         | Production | t/ha         | Rank |
| Wheat     | 11.2              | 11.4       | 2            | 2          | 2.5          | 32   |
| Rice      | 28.5              | 21.4       | 1            | 2          | 2.8          | 35   |
| Pulses    | 36.6              | 26.0       | 1            | 1          | 0.6          | 118  |
| Groundnut | 35.2              | 28.6       | 2            | 1          | 1.0          | 50   |
| Sugarcane | 20.0              | 22.6       | 2            | 2          | 65.9         | 34   |
| Cotton    | 20.7              | 14.0       | 1            | 3          | 0.9          | 57   |

[Source: Fertilizer Statistics (2002) cited in *Survey of Indian Agriculture 2006* (The Hindu).]

economic profile of a country like India, to get rid of the problem of technology fatigue it is essential that all such R&D efforts should have a pro-poor, pro-nature, pro-woman orientation (*i.e.* a social equity focus.)

#### **Other causes: Economic, ecological, institutional and policy-related issues:**

In the Indian scenario, it would be over simplistic to assume that just technology fatigue alone gives rise to agricultural crisis, or addressing this problem would lead to enhanced agricultural development. Researches have shown that a number of other factors are also important, like, economic, ecological, institutional and policy-related. In fact, these factors are intricately related and often work together. The present crisis may very realistically be considered as the cumulative effect of all these factors, though as already noted the issue of technology fatigue is at the centre of all such factors. Here, economic factors include prices of agricultural inputs and outputs, proximity to input and output markets, infrastructure, agriculture-industry linkages, contract farming, access to credit, investment (public and private) and so on. Ecological factors include water resources (both ground and surface), quality of soil, bio-diversity, etc. Institutional factors refer to all institutions (both farming and informal) relating to farming and other allied activities. All these factors (economic, ecological, institutional and also technological) are highly endogenous in nature. These are dependant on each other and also dependant on government policies. Thus, policy-related factors are quite important and have a bearing on all others.

### **Part – III**

#### **Revival of Indian agriculture: Some macro level strategies:**

In view of the foregoing the significance of enhanced agricultural growth for both poverty redressal and sustaining the current pace of high growth is well recognized. A few pragmatic, time-tested strategies have been suggested in the following paragraphs considering,

inter alia, the peculiar features of Indian agriculture and successful experiences in other parts of the world.

#### **Modern technology (HYV, Hybrid varieties etc.): Need to focus on higher value seeds:**

It is a known fact that HYV seeds have played a cardinal role in agricultural development of India in the pre-reforms period (1968-1990, Green Revolution period). It is worth pointing out that poverty ratios are low in the Indian states (like Punjab, Haryana, Andhra Pradesh and Tamilnadu) that have adopted such modern varieties of seeds. The remarkable achievement of China through the use of hybrid rice technology had benefited that country tremendously in the late 1970s and the 1980s. Chinese experience motivated other countries including India to follow them and to invest more in hybrid seed R and D in the 1990s. But, outside China, including in India, hybrid rice experiment has not been very successful in spite of the huge investments already made. This is associated with sizeable opportunity cost as well. Janaiah (2003) has observed that hybrid seeds have got 12-16 % higher yielding potential in farmers field in India. Poor market price for hybrid rice grain because of poor grain quality is reported to be one of the reasons for its poor acceptance. In India scenario future research should focus on breeding of high value varieties of seeds that would ensure better profitability to the farmers while replacing the existing ones. Further, as the hybrid rice is a management-intensive technology, improved complementary crop management methods are needed to exploit the full potential of improved varieties. Rice hybrids suitable for direct seeding should also be developed in view of the labour shortage in irrigated rice systems. Above all, as far as possible the research should mainly focus on development of new parental lines with improved grain quality. Private sector participation should be encouraged not only in hybrid seed production and marketing but also in applied research on refinement of seed production, private sector being the main beneficiary among all.

For developing nations like India, the need of the

hour is a revolution in agricultural technology – a technology that improves the productivity, affordable, environment-friendly, and after all suitable to the local socio-economic environment. In view of the huge investments already made, the future efforts should be to develop appropriate technologies emanating the same parental lines, rather than going for altogether new ones though successful in other countries. Genetically modified (GM) groups – such as those resistant to drought, water-logging, soil acidity, salinity and extreme temperatures – could help to sustain farming in marginal areas and to restore degraded land to production. For instance, pest-resistant varieties can reduce the need for harmful pesticides can reduce both cost of production and environmental pollution.

***Affordable agricultural credit: Focus on co-operative sector and priority sector credit:***

It is a known fact that co-operative sector can play a vital role in the development of the nation by ensuring wider participation of the common man in the agricultural development. But, the reality is that in the post-reforms regime the significance of co-operative movement as well as directed credit policy of banks and financial institutions as per the directives of the government has been greatly challenged. The wrong notion that credit to agriculture and other priority sectors are not qualitative and riskier still exists, though recent researches have proved otherwise. More conducive policy towards agriculture and other priority sector is an imminent need to ensure rapid and sustainable economic development of the nation.

***Financial inclusion: Focus on micro finance with self help group (SHG) linkage:***

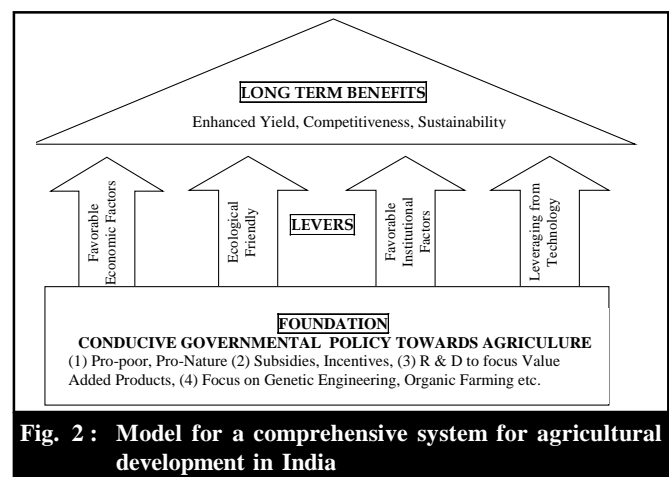
Non-availability of adequate credit facilities is one of the reasons for the underperformance of Indian agriculture. For enhancing credit availability, banks have to follow an aggressive and inclusive credit policies. For inclusiveness micro finance route seems to be advisable. SHG-linked micro finance schemes have been performing well in India, and such initiatives have had good repayment track record also. Hence, these need to be encouraged. The latest development in micro finance, enactment of Micro Finance Bill in the Indian Parliament is yet to be fulfilled. Meanwhile, issues relating to fine tuning of the micro finance system, like uniformity in respect of institutional lending procedures, clarity regarding the rights and accountability of the members, protection of the interests of the lenders and public etc. have to be sorted out.

***Organic farming: an emerging area:***

Organic agriculture seeks to establish an ecological balance with nature. As per the estimates of International Federation of Organic Agriculture Movement (IFOAM), the total organically managed area in the world is about 26 million. Organic farming is being employed in about 150 countries globally. The market for organic products are steadily on the rise, especially in countries such as Europe, North and South America, Canada, Finland, US, Sweden, and Denmark. Further, it is estimated that the global market for organic products would reach about 35-40 billion US Dollars by 2010. In spite of the promising future of the market as above and also its utmost suitability in a country like India, the government is yet to recognize its potential fully and to give the significance that it deserves. In the Indian scenario, the biggest hurdle in the growth of organic farming is the high cost involved in getting an organic certification for the farmers for their produce. Currently, getting such a certificate is quite difficult for the small and marginal farmers. Moreover, the validity of the certificate expires after 3 to 4 years. Therefore, urgent measures are required to ease the procedural formalities and to reduce the cost involved.

***Conclusion:***

In spite of the constantly declining performance of the Indian agricultural sector over the years, there seems to be good prospects for it to grow and prosper once the conducive policy infrastructure is put in place. This in turn would greatly help to set right the technological, economic, ecological and institutional issues. For ensuring a balanced and sustained growth of the economy in general and the agricultural sector in particular, it is quite important that all the developmental initiatives, technology related or otherwise, are pro-small farmer and pro-nature. Fig. 2 depicts a comprehensive system for agricultural



**Fig. 2 : Model for a comprehensive system for agricultural development in India**



development on the above lines.

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