India Vs. China In The Agricultural Sector - An Empirical Study

"The 19th Century belonged to Britain, the 20th Century belonged to America and the 21st Century will belong to Asia; China and India"

- Philip Dodd

****C.T. Sam Luther***

INTRODUCTION

India and China are the two most talked about Asian countries in recent times in terms of economic growth, but both have resorted to different routes for their growth. Both the countries are growing rapidly and virtually today, they are the key drivers of the world economy. They are competing with each other at one level; at the same time, they are cooperating with each other through joint ventures to maximise trade opportunities. There was a time, when the world looked to the West with wonder, but not anymore. Now, the East is beginning to appear a lot more interesting, because of the emerging economic growth of India and China and their ramifications on the global economic scene. Despite their massive populations and the problems associated thereto, they are quite different in their economic structures, sources of growth, and areas of competitive advantage. And the impact they make will remain different in the coming years.

Before the 19th century, China and India were the richest nations on earth. Long before the emergence of Europe, China and India had high standards of living and numerous technical and scientific inventions. Yet, in the beginning of the nineteenth century, things began to change dramatically and both countries experienced a long relative decline, eclipsed ultimately by Europe and North America.

The reversal of China's fortunes began in 1978 when Deng Xiao Ping came to power and instituted market-oriented economic policies. A decade later, in the early 1990s, in order to make the Indian economy globally competitive, the government reversed decades-old socialistic policies and gradually embarked upon market-oriented economic policy. Since these policy reversals, both countries have grown rapidly. Both countries have landmark developments and achievements, particularly in the reduction of poverty. Both have experienced impressive growth in agriculture - a Green Revolution, followed by rapid industrial growth and a sharp increase in the income of middle class. But the preconditions and the driving forces behind the growth were very different in the two countries.

AGRICULTURAL SECTOR – INDIA

India is a land of villages with 80 per cent of its population residing in about six lakh villages. It is predominantly an agricultural country and agriculture forms the backbone of the economy. Though the farmers carry out the cultivation with age-old traditional methods, agriculture in India has undergone changes of one kind or the other, mostly in the positive direction during the past several decades.

Prior to mid-1960s, India relied on imports of food products to meet domestic requirements. However, two years of severe drought in 1965 and 1966 awakened the Indian leaders and they understood that they could not rely on imports alone for food security. Consequently, they adopted significant policy reforms, focused in particular on the production of cereal grains with the goal of food self-sufficiency, which resulted in the Green Revolution in early 1970s. As a result of the Green Revolution, food grain production soared and by the early 1970s, India became self-suf ficient. Researchers attribute this success to the price incentives provided to farmers, the dynamism of the national research system and the availability of credit and inputs such as improved seeds, canal irrigation and subsidised supply of fertilizers. The success of this coordinated approach demonstrated that even in a country as diverse as India, the government can play an important role in setting the agriculture sector on a high growth path. In the 1980s, the policy had been shifted to "evolution of a production pattern in line with the demand pattern". Impressive strides were also made in other agricultural commodities like oilseed, fruits and vegetables and in other sub-sectors such as dairying, fisheries and livestock. As a result, after Brazil and US, India was well-positioned to become the 'food basket' of the world. A recent study by the World Bank on the agriculture sector points out that the country is very competitive at the farm-gate level. It's no more a traditional sector; the ways of processing, marketing and retailing have changed dramatically.

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But, inefficiencies also stepped in, as a result, there are huge amount of wastages of agricultural products. It is estimated that the annual wastages are around Rs.55,000 crores. Issues such as middlemen menace and poor packaging facilities are also the major constraints in the supply chain. Another major challenge is the growing gap between economic growth rate and the growth in the agriculture sector. When the economy is growing at 8 to 10 per cent, the agricultural sector is showing a marginal growth of 1 to 2 per cent, resulting in a huge gap. In the days to come, the gap is only going to widen unless the government initiates significant policy changes.

AGRICULTURAL SECTOR - CHINA

China's reforms in the agricultural sector were launched much early in the 1950s. It collectivised agriculture with the establishment of the commune system at that time. After this, they replaced the commune system and its variants in 1970s with family-operated farms or 'household responsibility system' introduced by the Deng Xiao Ping regime. The aim was to build the structure of an enterprise on the foundations of egalitarianism. The unleashing of private initiative in farming resulted in the phenomenal growth of agricultural output from less than 3 per cent in the earlier years to more than 7 per cent in the early 1980s and gave a big impetus to the rural economy. The rural household income increased by 50 per cent during the years 1978 to 1984. However, subsequent deceleration due to rapid industrialisation resulted in drop in the average growth rate to 2.8 per cent during post-1980 period and there was drop in the share of GDP from 36 per cent in 1970 to 15 per cent in early 2000s and the GDP was just 13 per cent in the year 2004.

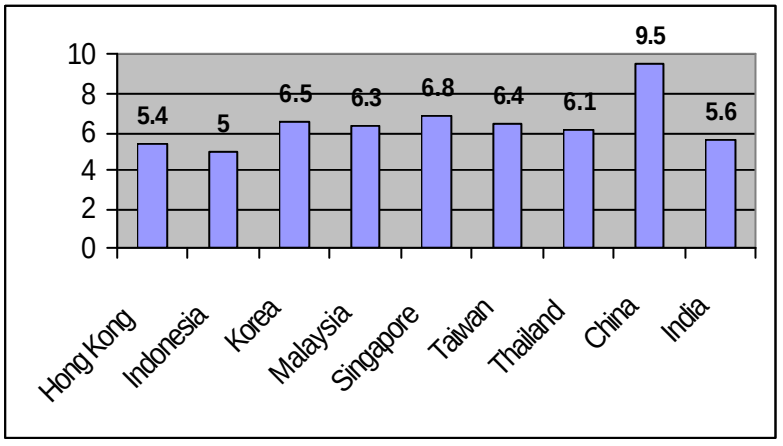
Rising income and urbanisation have also made significant changes in the level and pattern of food consumption in China. The farming sector has been diversified into other areas to meet changing food demands. Meat production (pork and poultry) shot up and the demand for food grains such as maize and soybeans have risen. Production of aquatic products also showed very rapid growth.

As a result of market and trade liberalizations initiated in 1979, China has made a gradual shift from land-intensive commodities to high-value labour-intensive commodities such as horticultural crops, livestock and fisheries. Trade policy and exchange rate reforms have given a further boost to agricultural production for export. The ratio of total exports to the GDP increased from 6 per cent in 1980 to 36 per cent in 2004, while agriculture's share of exports declined from 3 to 2.5 per cent, but in terms of the US dollar value, net agricultural exports increased 100-fold over the last two decades.

Recently, the Chinese government decided to change its rural spending plan. In March 2006, Premier Wen Jiabao announced that the government would make a concerted effort to build "a new socialist countryside" over the next five years. The government announced a 14 per cent increase in its 2006 rural budget to Rmb340 billion (US$42 billion, 1.7 per cent of GDP). It has also abolished the tax on agricultural income and plans to invest US$148 billion on rural roads over the next five years.

KEY ECONOMIC INDICATORS – INDIA VS. CHINA

Exhibit - 1 : Average Annual GDP Growth of Select Countries (1980 to 2004)



Source – IMF data base

Exhibit - 2: Sector breakdown of GDP (%)

Year	1960	1970	1980	1990	2005	Average	CGR
India							
Agriculture	53	46	40	33	20	38.4	-20.79
Manufacturing	18	21	23	26	26	22.8	9.81
Services	29	33	37	41	54	38.8	17.11
China							
Agriculture	24	36	30	27	13	26	-7.13
Manufacturing	44	40	49	42	47	44.4	2.76
Services	32	24	21	31	40	29.6	9.79

Source – Morgan & Stanley

Exhibit – 3: Agricultural Growth Rates (GDP vs Agriculture)

India	2000	2001	2002	2003	2004	2005	2006	Average
GDP (%)	6.2	4.4	5.8	3.8	8.5	7.5	8.1	6.33
Agriculture & allied activities (%)	0.6	0.2	5.8	-5.6	9.6	1.2	2.1	1.99
China								
GDP (%)	7.6	8.4	8.3	9.1	10	10	9.9	9.04
Agriculture & allied activities (%)	2.8	2.4	2.8	2.9	2.5	6.3	5.2	3.56

Source – Morgan & Stanley

Exhibit – 4 : Competitiveness In Agricultural Exports

Year 2004			
	World	China	India
Agricultural products (US$bn)	783	24	9
World share (%)		3.20%	1.20%

Source – Morgan & Stanley

The latest World Economic Outlook database of the IMF provides a capsule summary of some of the world's fastest-growing economies (Exhibit – 1). The average annual growth rate was 9.5 per cent in China during the period 1980 to 2004, whereas it was just 5.6 per cent in India, which indicates the absolute superiority of China. The good news for India, however, is that it has joined the fast-movers club.

The segment wise growth mix for the years 1960, 1970, 1980, 1990 and 2005 is presented in Exhibit – 2. In China, the average contribution of the manufacturing sector to GDP was 44.4 per cent, whereas it was just 22.8 per cent in India. But the cumulative growth rate was 9.81 per cent in India as compared to the CGR of 2.76 per cent in China. Reverse is the case with the contribution of service sector to the GDP. In India, the average contribution of the service sector to the GDP was 38.8 per cent with a CGR of 17.11 per cent, whereas, the average contribution of this sector to GDP was 29.6 per cent with a CGR of 9.79 per cent in China. In the agricultural sector, the average contribution to GDP was 38.4 per cent in India and 26 per cent in China. Surprisingly, the CGR of agriculture of both countries shows negative trends with a huge decline of 20.79 per cent in India and a decline of 7.13 per cent in China.

The same trend can also be noticed in the agricultural sector's growth rates (Exhibit – 3). The growth rates of GDP and agriculture of China for the years 2000 to 2006 indicate that the GDP has an average growth rate of 9.04 per cent, whereas, the agricultural and allied activities have a growth rate of 3.56 per cent only. In India, the average growth rates during the same period were much below as compared to China. The growth rates of both variables were 6.33 per cent and 1.99 per cent only.

The declining growth rates of agricultural sector are due to some unique factors in both the countries. In China, much of the people who were engaged in the agricultural sector had moved to the special economic zones (SEZs) due to the mass industrialisation efforts taken and it is estimated that China's booming manufacturing sector sucks in 1 per cent of the farming population every year. India has a different story. Compared to the manufacturing sector where restrictions are still persistent, boosts in service sectors such as IT and IT enabled services, business process outsourcing (BPO), tourism, banking and insurance have recently been the centres of attraction for a lot of people once engaged in the agricultural activities. Especially India is a prominent host country for outsourcing preferred by US and European investors to set up consulting service industries such as call centres.

The competitiveness of agricultural exports is presented in Exhibit – 4. In the year 2004, the global exports of agricultural products were US$783bn, of which the contribution of China was US$24bn and India's contribution was US$9bn only with relative proportions of 3.2 per cent and 1.2 per cent respectively.

DIFFERENCES BETWEEN INDIA AND CHINA

No doubt, at present, China's track record in the agricultural sector is far superior to India, though the two countries had the same position 25 years ago. How did China perform much better than India in the agricultural sector? The answer lies in certain basic differences that distinguish the agricultural sectors' growth and a few differences are discussed in the following paragraphs:

LAND REFORMS AND LAND USE

China, as part of land reforms, initiated de-collectivization process in 1970s and created millions of smallholder farmers. They changed the land tenure system from commune-based to household responsibility system at that time. India also has started the land reforms during the same period but the reforms were successful in some states, but not in others. While 80 per cent of operated land holdings in India are very small - 2 hectare or less, there is also a huge landless population. As India is a federal state and most agricultural issues are dealt with at the state level, uniform institutional change is far more difficult to achieve than in China.

But India's agriculture is placed favourably (Exhibit – 5) as compared to China's in terms of quantity of arable land (161mn ha vs. 130mn ha), irrigated area (56mn ha vs. 55mn ha), average farm size (1.4 ha vs. 0.4 ha), and farm mechanisation (15.7 tractors per 1000ha vs. 7 tractors per 1000ha).

Exhibit – 5 : Factors Favouring India

	India	China
Arable land	161 mn ha	130 mn ha
Irrigated land	56 mn ha	55 mn ha
Average farm size	1.4 ha	0.4 ha
Farm mechanisation (per 1000 ha)	15.7 tractors	7 tractors

Source: Economic Outlook, 2007-08

Exhibit - 6: Productivity Level of Various Crops

	India	China
Ave. yeild (2003 to 2005) Kg/ha -		
Rice	3034	6233
Wheat	2688	4155
Rape and Mustard	909	1778
Ave. growth rate for 15 years - Rice	1%	2.10%
Rape & Mustard	0.6%	3%
Rice production in 2004 (mn. tons)	124	186
Wheat production in 2004 (mn. tons)	72	92
Fruits & veg. production(mn tons) - 1980	55	60
-2003	135	450
Share of animal husbandry & fisheries(2005)	45%	30%

Source: FAO & Morgan & Stanley

However, the two widest agriculture-related discrepancies between India and China lie in the diverging productivity levels of various crops and in the differential mix of crop and non-crop segments in the overall composition of the farm sector (Exhibit – 6). The average yield of rice in China during the period 2003 to 2005 has more than doubled as compared to India (6233 kg/ha vs. 3034 kg/ha). For wheat, the corresponding figures were 4155 kg/ ha and 2688 kg/ha and for rape and mustard, the figures were 1778 kg/ha and. 909 kg/ha respectively. When we analyse the trend for the production of rice in 15 years up to 2005, it was only 1 per cent growth in India compared to 2.1 per cent growth in China. In 2004, India produced 85 million tonnes of rice compared to China's 179 million tonnes, despite having almost double the area under paddy cultivation (42 million ha in India vs. 28 million ha in China). The production of wheat has not shown much difference. In 2004, China produced 92 million tonnes of wheat compared to 72 million tonnes produced in India. Regarding rape and mustard, China marked growth rate of 3 per cent compared to India's growth rate of just 0.6 per cent. The horticultural sector also witnessed better performance in China than India. In 1980, the production was 60 million tonnes in China as compared to India's 55 million tonnes. But in 2003, horticulture production in China leaped to 450 million tonnes, way ahead of India's corresponding production of 135 million tonnes. The contribution of animal husbandry and fisheries accounted for 45 per cent of the total in 2005 in China compared to just 30 per cent in India. China has thus clearly developed more diversified productivity levels of different set of agricultural crops than India to increase net farm incomes.

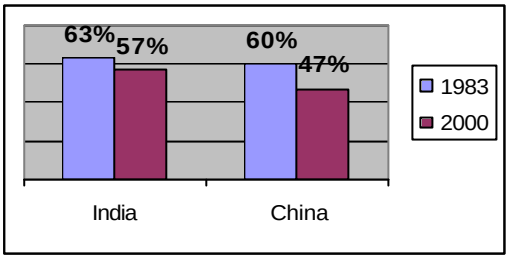
RURAL EMPLOYMENT

China has started the reforms first with agriculture. The agricultural sector has grown rapidly, creating a lot of funds and manpower surpluses for fuelling industrial growth, notably in the small and medium industrial sector. Thus, of the total employment of around 730 million people in 2000, the people employed in agriculture were 47 per cent, down from 60 per cent about two decades ago. Economists give special consideration for the 'turning point', when the proportion employed in agriculture falls below 50 per cent, indicating the transformation from a dominant and all-important agricultural sector to an important but not dominant industrial sector.

In the case of India, the proportion employed in agriculture was 63 per cent in 1983, which dropped to 57 per cent in 2000. Although India has achieved food grain surpluses, probably at high cost, it is yet to see the Chinese-style high rates of rural savings and their use in small and medium industry and the transfer of surplus manpower from agriculture to those sectors based in villages and small towns.

Exhibit – 7: Agricultural Employment

(as % of total employment)



Source – Morgan & Stanley

INFRASTRUCTURE

The major constraint for rapid economic growth for India is its poor infrastructural facilities. India is handicapped with relatively inefficient and high-cost infrastructural facilities namely - electricity, roads, ports and airways. China, on the other hand, has superior basic infrastructure. In addition to the agricultural pre-condition for rapid overall growth, the Chinese took one other major initiative - building infrastructure ahead of need.

In India, policy makers have realised the importance of good infrastructure to attain rapid economic growth only in 2000s and started investing in the telecom, roads, ports, construction and airways. The following table depicts the vast difference between the two countries with regards to the infrastructural facilities.

Exhibit 8 : Infrastructure spending (in 2005)

(as %age of GDP)

	India	China	Ratio
Transport	1.4	4.3	3.07
Railways	0.4	0.7	1.75
Roads	0.7	3	4.29
Ports	0.2	0.4	2.00
Airports	0.1	0.2	2.00
Communication	1	0.9	0.90
Electricity	1.1	3.6	3.27
Urban infrastructure	0.1	0.3	3.00
Total	**3.6**	**9**	**2.50**

Source - Morgan & Stanley (adopted)

Exhibit - 8 clearly indicates the superiority of China in its infrastructural development. In 2005, the overall infrastructure investment of China as a percentage of GDP was 2.5 times higher than India. The most critical infrastructural developments required are roads and electricity for the growth of the agricultural sector. In both, China's spending was much higher. In road infrastructure, China has spent 4.29 times more than India and in the case of electricity; China's spending was 3.27 times higher.

SAVINGS RATE

Researches reveal that there is little evidence that political systems ever had anything to do with the China-India divergence. China's huge investments are funded mainly by its higher savings rate, which is around 40 percent of GDP, whereas the savings rate is just 20 percent of GDP in India (Morgan & Stanley). One of the reasons for

high saving rate is agricultural productivity, which has been consistently more than double in China as compared to India for the last three decades.

Moreover, in most of the states in India, land tenure system has not been changed and the majority of the farmers are tenants or indentured labourers. This backwardness is the main reason for the poor savings rate. Demographics, however, favour India. It is estimated that by the next decade, China's population will begin to age rapidly and the savings rate will fall. India, however, is just entering an era of "demographic dividend", driven by a young workforce that will probably last for the next three decades.

POVERTY REDUCTION

In India, there was a significant decline in poverty in late 1970s. From the late 1970s to early 1990s, the poverty ratio fell from 51 per cent to 42 per cent (based on India's official poverty line), mainly due to the substantial improvement in agricultural production and productivity. Further reduction in poverty could not be attained due to unequal distribution of landholdings and the large landless population. There are also significant regional variations within India, such as between states or between districts. However, there was further drop in poverty ratio from 42 per cent in 1990 to 34 per cent in 2002 largely due to the growth of the industrial and service sectors. Yet, due to fairly rapid population growth, absolute numbers in poverty increased from 351 million in 1990 to 357 million in 2002.

Exhibit - 9: Poverty Index

	Year	India	China
People in poverty(mn)	1990	351	377
	2002	357	203
As % of total population	1990	42	33
	2002	34	16

Source – Morgan & Stanley

In China, poverty has declined from over 33 per cent to less than 3 per cent of the total rural population and much of this occurred in the early reform period. Based on the dollar-a-day poverty line index, the incidence of poverty dropped from 33 per cent in 1990 to 16 per cent in 2002. The estimated decline in numbers during the same period dropped from 377 million to 203 million. Overall economic growth (as measured by per capita GDP) has been a primary source of rural poverty reduction in China. However, the widening urban-rural income gap affects poverty reduction in China and the Chinese government takes the initiative to ensure that the future growth has to be more broad-based.

RESEARCH AND DEVELOPMENT

India has a huge market for biotech products and has the advantage of low cost technology (for clinical trials, R&D, molecule synthesis), competent scientists and researchers, a network of bioscience centres and a strong IT infrastructure. The biotech work outsourced to India is in the form of contract research and clinical research and research process outsourcing. India has also achieved success in areas of enzymes, vaccines, diagnostics and veterinary products. The Indian government also offers 150 weighted average tax reductions on R&D expenditures of recognised R&D facilities. Yet, the research track record is abysmally low. The current agricultural productivity is roughly equal to what China achieved in the mid-80s. Production of grain and pulses has in fact, been stagnant for a decade, and there has been virtually no breakthrough in seeds or yield since the Green Revolution. The number of field crop varieties released by the Indian Council of Agricultural Research (ICAR) actually fell by 50% between 1997 and 2001, despite the fact that there was a sharp and sustained increase in funding for the organisation.

On the other hand, the agricultural research institutes in China must use the government funds purely for research. Funds relating to salaries and other administrative expenses are to be generated by the centres themselves. Thus, the centres make joint ventures with private sector companies to form commercial spin-offs from their research. China has over 1000 R&D centres devoted to agriculture and there is a huge push towards developing new strains of plants. It focuses on agricultural bio products (BT variety, rice crops - for instance, around two-thirds of all cotton grown in China is BT cotton and nearly 100 per cent of paddy produced are of modern varieties), biotech protein drugs, and the traditional Chinese medicines. It also provides biotech firms

with around two-year tax exemptions on revenues. This is followed by a 50 percent rebate on enterprise tax for the next three years, which is usually extended to another three years.

INVESTMENT VS. SUBSIDY

In India, the main form of government assistance to farmers has been through subsidies rather than investment in rural infrastructure. Free or subsidised supply of power, subsidised fertiliser, waiving of loans etc. are provided to the farmers in India, not with an investment-return notion, but with political connotation. China does not provide its farmers with subsidies for fertilisers and power. For instance, China has spent RMB340bn ($44.7bn) for agricultural investment, of which only 5 per cent has been given by way of subsidies to farmers. According to Prof. Huang, Director of the Centre for Chinese Agricultural Policy, there is some debate regarding subsidies and their utility in China, but the government realises that on the whole, subsidies are against market reforms. The subsidies so provided distort the market as well as reduce resource efficiency.

CAN INDIA DO BETTER?

Compared to China, India is a well-equipped country when it comes to agriculture and in the long run, the country will become more than self-sufficient in food production. But in China, agriculture is a highly exploited sector. It can never become independent of food production. However, this is not the case with India. The country can improve its agriculture sector provided we adopt the right kind of strategies. Let's see a few such strategies to be adopted in the following paragraphs:

- **Sustainable Agriculture:** Agricultural resources are important renewable natural resources. Increasing the food production while maintaining harmony with the environment is the core concept of sustainable agriculture. It calls for improving the productivity of existing cultivated lands, restoring the productivity of degraded and wastelands after reclamation, and providing timely warning for impending natural disasters so that farmers can take suitable preventive measures. In this context, reducing knowledge gaps and increasing knowledge sharing for farmers is an essential first step. Empowering farmers with relevant, timely information about different crop varieties, including details about their ability to withstand drought, salinity, nutrient deficiency, water logging etc. can significantly reduce farming risks. The information and communication technologies (ICTs), including geographical information systems (GIS) can make such information more widely available in rural areas.
- **Competitive Prices**: The most serious threat to our agriculture sector is now from international competition. The prices of farm products in the international markets and Indian markets are moving in opposite directions. Prices in the international markets are declining, whereas in the Indian market, prices are increasing. Rapid progress in the field of biotechnology and the use of sophisticated farm machines reduced the cost of production at the global level, but in India, the low yielding seeds and traditional tools of production lead to decline in productivity and high cost of production. As a result, over the past decade, Indian agricultural sector faces unfair competition from cheap imports, which poses serious threat to the community. Moreover, the irony of the situation is that while market prices of agricultural products are exorbitant, the farmers get an unremunerative return. A major chunk of the margin is eaten up by the large number of intermediaries or lost as avoidable wastage due to poor infrastructure.

For any country, pricing policy has been an effective tool in controlling price levels while encouraging farm production and supporting weaker sections of the rural population. Though six decades have gone since India's independence, our farm community still depends upon minimum support price (MSP). They grow only those crops where MSP is assured. This must change and farmers should be encouraged to grow any crop profitably. For this, they must have the awareness about market activities, market efficiency, pricing and even know import and export of value added agricultural products.

- **Better Infrastructure**: Another important concern is the poor infrastructure in marketing agricultural products. It is estimated that the number of regulated agricultural markets stood at 7520 as on 31st March 2005. Besides, there were 27300 rural periodic markets, of which, only 15 per cent functions under the ambit of regulations. Still, 0.3 million Indian villages have no access to telephones; 50 per cent of the rural roads remain unserviceable, resulting in a huge gap between rural producer and urban consumer.

To address these issues, India needs to mobilise capital more effectively and streamline the process for the implementation of rural infrastructural facilities. Further, the development of the Indian agricultural sector mainly depends on a constant policy response from the government. The government-controlled agricultural policy institutions have to exploit the opportunities provided by globalisation to minimise the risk that it may bring along. If managed well, the new opportunities created by globalisation have the potential to improve the lives of millions of Indian poor who depend on agriculture.

- **Value Addition**: Value addition to agricultural products is crucial to enhance its productivity. Food processing industry can play a major role in this regard. Food processing is unique as it covers a fairly broad spectrum of products based on a wide range of raw materials from agriculture to its allied activities such as horticulture, plantations, animal husbandry and fisheries. As such, for a country like India, endowed with diverse climatic regions and a long coastline, producing a variety of crops, fruits, vegetables, flowers, livestock and seafood, the food-processing sector has great potential to improve the rural economy. Food-processing needs adequate market intelligence, the right kind of infrastructure, internationally acceptable certificates, better sanitary facilities and proper packaging.

The recent development in setting-up of agro-food parks seems to be a better solution conducive for the Indian agriculture sector. The food parks should have state-of-the-art processing facilities, supply chain management systems, cold chain and warehousing facilities. Also, such parks need hi-tech agriculture trade and felicitation centres, agro-tourism services, incubation centres, training centres and sufficient professional manpower that have necessary skills to run it. It is learnt that about 60 food parks were designed by the central government all over India but only two parks in Chordia near Pune in Maharastra and Virudhunagar in Tamil Nadu are active. Indian agriculture sector can witness sea change, provided the remaining food parks also start functioning.

- **Environment Protection**: Rapid economic development puts stress on India to successfully manage its resources, sustain agricultural growth rates to meet food security and poverty reduction programmes. Especially, environmental degradation as a result of the economic development is of serious threat to India.

For instance, soil problems like land erosion, fertility losses, salinisation and desertification are reducing the land area suitable for cultivation. Excess use of fertilizer is resulting in both environmental problems and problems related to food and water safety. Scarcity of water and declining water quality are other major concerns. The overexploitation of groundwater has led to the slow down of growth in grain production all over India. This has important implications, in particular, for the long-term growth of agricultural products.

The Common Minimum Programme (CMP), a politico-economic agenda of the present government that guides new government policy decisions, points out the reforms required on a priority basis in stopping the misuse of water and the unsustainable use of land. Also, CMP includes programmes and projects designed to transfer operation and management responsibilities to local user groups — known as 'Irrigation Management Transfer (IMT)'. However, the biggest challenge to the government is in managing the common property resources and prevent the over exploitation of groundwater. Linkage of the rivers without affecting the environment and ecology can be a better solution to address the water problems in India.

- **Role of The Private Sector**: The growing middle class and the potential vast resources in agriculture are already attracting private sector corporations and MNCs to the agricultural sector. Corporate farming is one such initiative, which involves the practices of corporations in food production on a large scale. It is a modern way of doing agribusiness, and encompasses not only the farm itself, but also the entire chain of agriculture-related businesses, including seed supply, agrichemicals, food processing, storage, transport, distribution, marketing, advertising, and retailing. HUL, Reliance, Bharti, Godrej, Mahindra and Mahindra et al. are entering into this new venture. At this juncture, what the government has to do is that its policies should facilitate the private players in the agribusiness by removing impediments such as the existence of the barriers to inter-state movement of agricultural commodities, doing away with laws that are biased against owners, eliminating price controls and monopoly in government procurement.
- **Bridging The Income Gap**: An inevitable consequence of rapid economic growth is an increase in income inequality. This is reflected in the growing disparity between the income of rural and urban people and the growing regional disparity between states and states, districts and districts and even villages and villages. Though the dollar-a-day poverty line index is declining, relative poverty is increasing which results in civil unrest quite often.

Empirical evidences in India also suggest that income growth benefits those just below the poverty line while progress is the slowest for the poor at the bottom line. Therefore, it is absolutely necessary for the central government and the respective state governments to make sure that the benefits of the policy reforms should reach the underprivileged rural mass so as to bridge the gap between haves and have-nots.

CONCLUSION

Undoubtedly, China is far superior to India in the agricultural sector. It is stated that an x % growth in agriculture would give a 2x % growth in the overall economy. The message is loud and clear. In order to make our nation a developed one, Indian agriculture must grow rapidly and that must be the basis for the evolution of a strong, small and medium industry sector established in the rural and semi-urban areas. Also, agriculture is intended to become not merely an efficient, eco-friendly production system, capable of meeting basic demands of the rapidly increasing population, but has to become a powerful instrument for a comprehensive socio-economic transformation of the country, including improvement in the quality of life of every individual. This is an exciting opportunity and a challenging responsibility for the policy makers and every other stakeholder.

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IMPLEMENTATION STRATEGIES

Having a defined system for managing quality and process improvement should be a foundation for almost any knowledge management system to be effective and both efforts can be very complementary, if they are used as tools to achieve a company's business objectives. The key to that synergy is a well-designed business management system that provides an overall framework for both Knowledge Management and Quality Systems. The full benefits of either approach will not be realized unless they are aligned with achieving business results and implemented as a part of an overall systems approach to management.

The implementation of such a fully integrated business system that provides all the benefits of a modern quality system as well as knowledge management capabilities can be quite complex and requires a considerable amount of planning and skill to implement effectively. It is a multi-dimensional problem and involves a broad level of cross-functional collaboration that many companies are not well organized to support.

It is unlikely that any company will achieve that goal of an ideally integrated system and it is unclear how it will be fully implemented, since this technology is still evolving rapidly; however, there are immediate opportunities for companies that recognize the inter-relationship of these two technology areas:

- Companies that have implemented systems for managing quality can revitalize those systems and make them more dynamic and more effective by incorporating knowledge management capabilities.
- Companies that are considering knowledge management efforts can improve the probability of success and effectiveness of those efforts by understanding the benefit to be gained by having a well designed business and quality management system as a foundation.

In either case, the approach should be focused on achieving real and measurable business results and should be designed for incremental growth so that it can easily evolve as the technology in this area evolves.