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INSIDE

Commercialization of agriculture is as a process in which farmers produce primarily for sale in distant markets, rather than meeting only their household needs. However, with marginal farm holdings in India, there is little surplus left with peasants for marketing their products.

Commercialization of agriculture, however, increases employment opportunities and income of the farmers.

Introduction of new technologies can increase farm productivity and is thus essential for commercialization of agriculture. With the advent of new technologies, the cash requirement of farm households has increased on account of increased use of fertilizers, insecticides seeds, necessitating the cultivation of cash crops on a large scale.

In the last two decades the ratio under cash crops has increased, especially fruits and vegetables. Traditionally India has been a producer of cash crops of cotton, tobacco and sugarcane.

Triggered by economic growth, urbanization, technologies and emergence of modern agri markets there has been shift in consumption pattern of food away from cereals towards high value agricultural products. This shift is welcome as it has led to an increase in farm incomes.

Marketing of agriculture produce has become important with increased commercialization of agriculture and newer technologies and systems, like spot exchanges are helping the farmer getting better deal for their produce.

With increase in prices of agriculture produce, agricultural markets have got integrated with the mainstream and international markets. Higher prices in combination with increased domestic demand and urbanization in turn can build rural economy. For this to happen greater emphasis will have to be put on commercialization of agriculture and increased use of advanced technologies.

Commercialization of agri products includes increase in marketable output relative to production, and changes in product-mix of crops more in favour of cash crops. □

ADOPTION OF TECHNOLOGY CAN CHANGE AGRICULTURE FROM SUBSISTENCE TO COMMERCIAL VENTURE

Dr. Harender Raj Gautam

Agriculture need to be commercialized to make it profitable so that it can attract people. Technology and high revenue could make agriculture attractive to the younger generation. Presently, most of the farmers are doing subsistence farming which hardly earns them enough to meet the requirements of their family. There is need to convert farming from subsistence to commercial so that people thriving on it could have surplus money for a secured and decent life. Though share of agriculture to overall GDP in India has come down to 14 per cent, still 66.2 per cent of rural males and 81.6 per cent of rural females are engaged in agriculture as cultivators or labourers. Agribusiness is the sum total of all operations involved in the manufacture and distribution of farm supplies; production activities on the farm and the storage, processing and distribution of farm commodities and items made from them. It refers to various businesses involved in food production, including farming, seed supply, agrochemicals, farm machinery, processing, marketing and sales. Thus, agriculture based industries are very important for creating value addition in our agricultural produce and also create enormous job opportunities for the rural youth. Our exports in agricultural products in 2012-13 were \$41

billion against agri-imports of \$20 billion, giving a net trade surplus of \$21 billion.

Food Processing: Processing of agricultural produce is an important aspect of commercialization in agriculture. Value addition of the agricultural produce can fetch higher price to the producer. Presently, processing of fruits and vegetables is only 2 per cent in India in comparison to 80 per cent in USA and Malaysia, 78 per cent in Philippines, 70 per cent in France and Brazil, 40 per cent in China and 30 per cent in Thailand. Food processing sector is an important segment of the economy, constituting a share of around 9–10 per cent of gross domestic product (GDP) in agriculture and manufacturing sector. In India, the raw material is in plenty as the total food production is likely to double in the next 10 years with the country's domestic food market estimated to reach US\$ 258 billion by 2015. With a huge agriculture sector, abundant livestock, and cost competitiveness, India is fast emerging as a sourcing hub for processed food. The Indian food processing industry accounts for 32 per cent of the country's total food market. **Food Processing Industry in India is currently growing at a rate of 14.9 per cent.** Residents in urban areas are the



largest consumers of processed food, consuming 78 per cent of all packaged food in 2011. According to data released by the Agricultural and Processed Food Products Export Development Authority (APEDA), Indian agricultural and processed food exports during April–December 2013 stood at US\$ 16,578.91 million as compared to US\$ 15,206.22 million during the same period last year. The share of food processing export in total exports from India is around 12 per cent. The Ministry has launched a Centrally Sponsored Scheme namely, National Mission on Food Processing (NMFP) during the 12th Plan. The Ministry is implementing a scheme for Human Resource Development (HRD) in the food processing sector on developing technologists, managers, entrepreneurs and manpower for quality management in the sector. The annual manpower requirement in the industry is estimated at about 5.3 lakh persons. With the objective of providing incentive to create integrated cold chain and preservation infrastructure facilities in the country, the Ministry is implementing the Scheme of Integrated Cold Chain, Value Addition and Preservation Infrastructure.

Hybrid seed market: Seed production is also a commercial venture with lot of potential for the farmers and other entrepreneurs. Quality seeds production is important skill in which the young can be trained in to augment their farm income. This will present them with more options in the farming sector. While seed production is a high income venture than crop production, hybrid seed production is much more lucrative with still higher returns. The Indian hybrid seed sector is now pegged at around Rs 12,500 crore. Among different crops, hybrid maize only accounting for little over Rs 1,500 crore and it could more than double to two lakh tonne a year from 90,000 tonne now in the next two years thanks to expanding demand from poultry and industrial sectors. The Indian hybrid seed market, with over 300 companies opens lot of opportunities to the farmers to produce quality certified seed of different crops. Seed market is growing at 15-20 per cent annually over the past several years and is projected to reach around Rs 18,000 crore by 2018. National Seeds Corporation (NSC) is a Government owned company and there are about 8000 registered seed growers all over the country under NSC alone who are undertaking the seed production programmes in different agro-climatic conditions. About 10 domestic and multinational companies control over 80 per cent of the market. To provide more opportunities to the

farmers, hybrid seed companies should have sound research and development capabilities. Different seed companies usually have contract farmers with assured consumption of their produce. All seed grown by contract growers for seed corporations meeting the specified standards attract a premium price over and above the commercial grain price for that crop. The premium can vary between 25 percent for cereals to over 100 percent for hybrids. There is huge potential for export of crop seeds as world market of seed is estimated of Rs. 2, 20,000 crores.

Agri-inputs: Production and supply of inputs required in agriculture is also a commercial venture with lot of scope to the farmers and unemployed youth in the country. Agricultural marketing system composes of two major sub-systems viz., product marketing and input marketing. In the product marketing, major players include farmers, village/primary traders, wholesalers, processors, importers, exporters, marketing cooperatives, regulated market committees and retailers. The input generation system includes input manufacturers, distributors, related associations, importers, exporters and others who make available various farm production inputs to the farmers. In agriculture, fertilizers, crop protection chemicals and farm machinery are the major inputs. Fertilizers are the critical inputs of agriculture and present consumption is more than 27.63 million tonnes (2011-12).

There is large chain of distribution across the country which provides avenues to thousands of people. Indian crop protection market has also lot of potential in the trade for the manufacturers and suppliers. Crop protection market is estimated at \$ 3.8 billion in FY12 with exports constituting about 50 per cent of the market. The crop protection market has experienced strong growth in the past and is expected to grow further at approximate 12 per cent per annum to reach \$ 6.8 billion by the year 2017. Bio-pesticides also provide lot of opportunities to the individual farmers to establish small units of production for the local consumption as there is increasing awareness for their use. Bio-pesticides, which currently represent only 4.2 per cent of the overall pesticide market in India, are expected to exhibit an annual growth rate of about 10 per cent in the coming years as our country is home to highest number of neem trees in the country also to number of such plants with pesticidal properties. In India, there are about 125 technical grade manufacturers (10 multinationals), 800 formulators, over 145,000

distributors. Farm machinery is also important input of our agriculture with lot of potential for its use in our future agriculture. The Indian farm machinery industry constitutes 10 per cent of the global market and is growing at about 5 per cent per annum. Farm machinery can create commercial venture for the youth in production of farm implements and retail distribution of all type of machinery. In addition, repair of farm machinery also provide commercial ventures to the farmers and the youth. Today, farm machinery and power industry accounts for over Rs. 50,000 crore of annual sales excluding farm implements and machinery manufactured/fabricated by the village craftsmen. Farm Machinery on the one hand will benefit the individuals engaged in different ventures and on the other hand will tremendously help to increase our farm yields. Impact analysis of some popular farm technologies showed that annual monetary benefit to the country through the use of these equipment/ technologies has reached the level of about Rs. 100,000 crore. Laser assisted land levellers, seed and fertilizer drills, paddy seeders, transplanters, rotavators, sprayers, weeders, irrigation pumps, micro-irrigation systems, reapers, combine-harvesters, sugarcane harvesters and threshers are some popular farm machineries in India.

Protected Cultivation

Protected cultivation in polyhouses or greenhouses is also one of the important facets of commercial agriculture where the farmer can get 4 to 5 times higher yield which will be quality wise better. Protected cultivation or greenhouse cultivation has improved crop production qualitatively and quantitatively world over in the last few decades. Presently, Spain, the Netherland and Israel are the leaders in the cultivation of crops in polyhouses and greenhouses. Spain has maximum area of around 70,000 ha under protected cultivation. In India, the area under protected cultivation is presently around 25,000 ha while the greenhouse vegetable cultivation area is about 2 000 ha. The Netherland is having less area than India under flower cultivation but in world's flower export, the Netherland's contribution is 70 per cent and India's contribution is around 1 per cent. It is because of advanced technology of poly houses in the Netherland. In the Netherlands, glasshouse cultivation covers less than 1 per cent of agricultural land but accounts for 40 per cent of the annual gross income from agriculture with annual crop revenue as high as 600,000 €/ha. There are

many successful examples and success stories of high-tech protected cultivation in India in places like Bangalore, Pune and Sonepat. In Pune in Marashtra, the Japan International Cooperation Agency is helping the local women to produce strawberry in computer controlled protected cultivation. Here, Strawberries are grown in a greenhouse equipped with an advanced nutriculture system. In this novel cultivation method, instead of soil coco peat is used which is abundant in India. The coco peat system is superior to cultivation using soil in every aspect: Almost no pesticide is necessary, there is minimal risk of disease, pests or root rot, and there is no need for professional knowledge or hard labour. Such greenhouses can be constructed even on barren land. Haryana Government has established Indo-Israel Centre for Excellence in Vegetables at Gharaunda near Karnal and is spread across six hectares. In these high-tech greenhouses, potential productivity of 302 MT per ha in Tomato, 211 MT in Capsicum and 151 MT in Cucumber. Now, India and Israel have now joined hands for setting up a centre for fruits at Mangiana village in district Sirsa, which is spread over an area of 72 acres. Saplings of citrus fruits, pomegranate, olive, guava and date had been planted in this centre. In Kerala, hi-tech farming is used for the cultivation of salad cucumber, capsicum, tomato, bitter gourd and beans. Around one tonne cucumber can be produced in 100 square feet which can ensure Rs 1.5 lakh as profit to the farmers.

Floriculture: Floriculture is another commercial venture in agriculture which gives 2 to 3 times higher returns per unit of area in comparison to other conventional foodgrain crops. The floriculture industry in India is poised at about Rs 5000 crore. According to ASSOCHAM, India's floriculture industry is likely to cross Rs 8,000 crore mark by 2015 which is growing at a compounded annual growth rate of about 30 per cent. Presently, about 232.74 thousand hectares area was under cultivation in floriculture (2012-13). Production of flowers is estimated to be 1.729 million tonnes loose flowers and 76.73 million tonnes cut flowers in 2012-13. But, there is tremendous scope for expansion as India accounts for less than one per cent of the global floriculture trade, which is dominated by Kenya, Ethiopia, Ecuador, The Netherland and Colombia. Karnataka, Tamil Nadu and Andhra Pradesh are the leading flower producing states in the country. Regions around Bangalore and Pune are the major production centres for cut flowers like roses and

carnations. Uttarakhand, Himachal Pradesh and Mizoram are emerging as new centres for cut flowers. Government of India has identified floriculture as a sunrise industry and accorded it 100 per cent export oriented status. Owing to steady increase in demand of flowers, floriculture has become one of the important commercial trades in Agriculture. Hence, commercial floriculture has emerged as hi-tech activity-taking place under controlled climatic conditions inside greenhouse. Floriculture in India is being viewed as a high growth Industry. Commercial floriculture is becoming important from the export angle also. The country has exported 22,485.21 MT of floriculture products to the world for the worth of Rs. 455.90 crores in 2013-14 and the major export destinations are United States, Netherlands, Germany, United Kingdom, United Arab Emirates, Japan and Canada.

Mushroom cultivation: Mushroom cultivation has become a profitable business with the produce fetching good returns in the market because of the rise in demand for edible mushrooms. Mushroom cultivation can be well augmented with other agriculture work as the crop is of only 3 to 4 months duration. India has tremendous potential as it generates over 600 million tonnes of agricultural residues and a large amount of it is either burnt in situ or left in the fields for natural decomposition. The annual world production of all types of mushrooms is estimated to be over 25 million tonnes. Our country produces only 0.12 million tonnes mushroom out of which button mushroom contributes about 85 per cent of the total mushroom production of country. There is need to use this vast reservoir of raw material, if 1 per cent of the available agricultural residues are utilized for mushroom production, the country can produce over 3 million tonnes of mushrooms and 10 million tons of organic manure annually. Commercial technology is available for production of about half a dozen varieties viz., button, shiitake, oyster, and wood ear and paddy straw mushrooms from temperate to tropical climates of the country. Mushroom has huge market in the domestic and international markets. In our country, per capita consumption of mushrooms is very low. However, per capita consumption has increased from 25 g to 40 g during the last decade and the domestic demand continues to grow at 25 per cent per annum. Mushrooms can play an important role contributing to the livelihoods of rural and peri-urban dwellers, through food security and income generation.

Mushrooms can make a valuable dietary addition through protein and various micronutrients and, coupled with their medicinal properties. Mushroom cultivation can represent a valuable small-scale enterprise option for the youth and women. On the other hand, mushroom cultivation can be done on large scale with big export oriented units also which can generate lot of employment opportunities for the farmers and unemployed youth. Presently, there are many commercial mushroom production units like Agro-Dutch Foods, Lalru (Punjab) with annual production capacity of 50,000 tonnes, Flex Foods, Dehradun (U.K.) (2,500 tonnes), Invent Foods, Hyderabad (4,000 tonnes), Himalaya International, Idar Gujarat (10,000 tonnes), Paonta Sahib (H.P.) (2,000 tonnes), Wakefield Mushrooms, Pune (M.S.) (2,000 tonnes), Balaji Mushrooms, Baramati (M.S.) (1,500 tonnes), INKAA Foods, Nalagarh (H.P.) (1,500 tonnes) and S.R. Mushroom Industries, Allahabad (1,500 tonnes).

In the conclusion, I will emphasize that agriculture is technology intensive and infusion of technology can increase the per unit yield by many folds. It all depends on the strength of the technology. Latest example of very high end technology is from Japan. Here farming has been now termed as industrial farming where the technology has really fructified into a 100 times more bumper harvest per unit of area. The best example is of an indoor farms like Miyagi Prefecture in Japan which is world's largest indoor farm illuminated by LEDs to meet the light requirements of the plants. The farm is nearly half the size of a football field (25,000 square feet) and it is already producing 10,000 heads of lettuce per day in multi-layer vertical beds. In this farm, discarded produce has been reduced from 50 per cent to just 10 percent of the harvest compared to a conventional farm. As a result, the farms productivity per square foot is up 100-fold. By controlling temperature, humidity and irrigation, the farm can also cut its water usage to just 1 per cent of the amount needed by outdoor fields. Thus, our research and extension institutions of agriculture have to work hard to abreast such technologies with a pace, test the same according to our conditions and most important is to accelerate infusion of such technologies to make agriculture commercial venture.

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COMMERCIALIZATION OF AGRICULTURE

Dr. RM. Chidambaram

Agriculture is the basic industry of India. Agriculture consists of farming and allied activities of agriculture viz., horticulture, floriculture, sericulture, pisciculture, dairy farming, poultry farming, piggeries and the like. Even in globalized India, majority of the population depends on agriculture. Sustaining and promoting agriculture need emphasis on the following grounds:

- a) Agriculture is the known operation in rural India. Hence its sustenance is easy.
- b) Agriculture and its allied activities generate employment opportunities for a vast majority of the population living in rural India.
- c) For the ever growing population, food security is essential. Though India is self-sufficient in food production, sustenance of such trend is possible only by promoting agricultural activities.
- d) As the land bank is inelastic in supply its value appreciation is a never ending phenomenon. As agriculturists are lured by fancy price for their land, they are desirous of selling their land to the real estate developers. Eventually the area under cultivation is diminishing. Promotion of agriculture is the only way to protect this sector from greedy people.

e) As agriculture is not a yielding proposition, many youngsters are moving towards urban centers resulting in urban congestion and depletion of contributors from rural areas by killing the avenues meant for rural development.

The points mentioned above are responsible to make agriculture a dismal profession in the minds of younger population. Commercialization is the only way to make agriculture a rewarding activity.

What is commercialization of agriculture?

Commercialization results in commercial viability. A profitable venture alone is commercially viable. Three dimensional approach is essential to make agriculture as a profitable venture. One, remunerative price for agricultural outputs. Two, easy marketability of agricultural produce. Three, risk minimization to motivate the farming community.

By understanding the significance of agriculture and the need for commercializing Indian agriculture, one may raise a question: How commercialization of agriculture is possible and feasible?

In order to find a practicable solution, the author approached farmers, officials of the Department of agriculture, bankers and merchants dealing in



agriculture produce. Their views are interpreted to make commercialization of agriculture a practical reality.

(1) It is visible that the area under cultivation is gradually depleting in India. There are two reasons responsible for such a unhealthy trend in a country like India where the population is ever growing.

- (a) Conversion of cultivable lands into concrete jungles – It is like killing the goose for a golden egg.
- (b) Unremunerative price for agricultural produce force many farmers to make their farm lands for the establishment of village industries, cottage units, small and micro enterprises.

A check on real estate developers is the need of the hour to put an end for the conversion of farm lands to erect concrete structures. Though the promotion of small scale units is helpful for the development of the economy, it should never be at the cost of agricultural development.

(2) It is an established theory that the application of qualitative inputs results in better quality outputs. Agriculture is not an exception to this theory. Though improved and scientifically proved seed varieties are available in India, but their cost is prohibitive to farmers. Agricultural research stations in association with Agricultural Universities have to develop improved seed varieties at an affordable cost to the farming community.

(3) Now the Department of Agriculture is maintaining close rapport with the farmers. Woooed farmers have certain requirements to make their avocation a remunerative one:

The Department has to assume the role of an intermediary in between the farmers longing for financial support for their operation and the institutional agencies extending the required finance.

The Department has to expand the warehousing and cold storage facilities in order to retain the agricultural produce especially perishable items to fetch a remunerative price in favorable market conditions.

No doubt, the transport and communication network is improving. Those facilities are to be

extended to the nook and corner of the country. Thereby farmers can identify potential markets and to distribute their produce for a fair price in places where the demand surpass supply.

(4) Agricultural economists use to say that Indian agriculture is dancing to the tunes of monsoon. At times, natural calamities shatter the plans and hopes of farmers. Eventually, farmers have to spend their accumulated wealth over the years to overcome such sufferings. Risks are common and agriculture in India is highly risk-prone. Mitigation of such risks are essential. For that insurance coverage is essential. It is expected that the corporate houses having forward and backward integration with agriculture have to undertake insurance coverage as a sort of corporate social responsibility.

(5) Though the market opportunities for agricultural produce are improving in India, its level is yet to reach the optimum. This effort is a joint one where the contribution of farmers, farmers' cooperatives, agencies of the state and central government is required. All these constituents are, no doubt, contributories. But when the corporate sector is supporting these constituents, there will be umpteen opportunities in marketing the agricultural produce. Export opportunities can easily be gauged by Indian multi-national companies.

(6) In India, 'agriculture' should be made a compulsory component of education at all levels viz., primary, secondary, higher-secondary and higher education. Regarding agriculture, it is not only cultivation aspects but beyond that. To be specific, they should go up to marketing. Mere knowledge orientation is of no use. All skills associated with allied activities of agriculture are to be honed. At the higher educational level, programmes on agricultural engineering, irrigation management, rural management, agricultural marketing, rural financing and the like are to be attempted with more of practical bias in order to lure the younger generation towards agriculture to contemplate a wedlock between 'young India' and 'resourceful Bharat'.

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AGRICULTURAL MARKETING

Reema Raghuvanshi

According to an estimate 85% of Wheat, 75% of Oil seeds in U.P; 90% of Jute in West Bengal and 60% of Wheat, 70% of oilseeds and 35% of cotton in Punjab are sold by the farmers in the villages themselves. Often the money lenders act as a commission agents of the wholesale traders.

In India, agriculture was practiced initially on subsistence basis, but with the development of means of transport and the storage facilities agriculture was followed not only for self consumption but also on commercial line. The farmers started growing those crops that fetch them a better price. Now a days marketing of agriculture produce is considered as an integral part of agriculture, since an agriculturist is encouraged to make more investments and to increase produce. Thus there is an increasing awareness that it is not enough to produce a crop or animal product, it must be marketed as well.

National Commission on Agriculture, defined agriculture marketing as a process which starts with the decision to produce a saleable farm commodity and it involves all aspects of market structure of system, both functional and economics considerations and includes pre and post harvest operations, assembling, grading, storage, transportation and distribution.

The Indian Council of Agricultural Research defined involvement of three important functions namely –

- Assembling (concentration)
- Preparation for consumption (processing), and
- Distribution

Present State of Agricultural Marketing in India: there are many ways by which the farmers may dispose of his surplus produce; major ways are as follows-

Farmers may sell their surplus agricultural produce to the village money lender –cum-trader, who may buy it either for self consumption or as an agent of a bigger merchant of the neighboring “Mandi” towns.

According to an estimate 85% of Wheat, 75% of Oil seeds in U.P; 90% of Jute in West Bengal and



60% of Wheat, 70% of oilseeds and 35% of cotton in Punjab are sold by the farmers in the villages themselves. Often the money lenders act as a commission agents of the wholesale traders.

- He may also sell the surplus in **Hats and Shanties**. Hats are village markets often held once or twice a week, while shanties are also village markets held at longer intervals or on special occasions. The agents of the wholesale merchants operating in the different Mandies also visit these markets. The area covered by a Hat usually varies from 5 to 10 miles. Most of Hats are poorly equipped and uncovered and lack of storage, drainage and other facilities. It is important to observe that only small and marginal farmers sell their produce in such markets. The big farmers with large surplus go to the larger wholesale markets.
- Another important method used for disposing surplus agriculture produce is through the **Mandies** or wholesale markets in small and large towns. The Mandi may be located at a distance of several miles and therefore farmers have to make special efforts to carry his produce to the mandies. In the Mandi, there are brokers or dalals who help the farmers to dispose of their produce to the wholesalers known as "**Arhatiyas**". The wholesalers may dispose of the agricultural produce which they have purchased from the farmers to the retailers, in case of cotton to the cotton ginning factories, and in the case of food grains like wheat, he sells to the flour mills or to the retailers.
- He may also make use of **Cooperative Marketing Societies** to dispose of his produce. A marketing society collects surplus from its members and sell it in the Mandi collectively. This improves the bargaining power of the members and they are able to obtain a better price for the produce. In addition to the sale of produce, these societies also serve the member in a number of other ways.

According to an estimate 85% of Wheat, 75% of Oil seeds in U.P; 90% of Jute in West Bengal and 60% of Wheat, 70% of oilseeds and 35% of cotton in Punjab are sold by the farmers in the villages themselves.

Facilities Needed for Agricultural Marketing: In order to ensure that agriculture marketing reaps the desired results the farmer should enjoy certain basic facilities:

- He should have proper facilities for storing his goods.
- He should have holding capacity, in the sense, that he should be able to wait for times when he could get better prices for his produce and not dispose of his stocks immediately after the harvest when the prices are very low.
- He should have adequate and cheap transport facilities which could enable him to take his surplus produce to the Mandi rather than dispose it off in the village itself to the village money-lender-cum-merchant at low prices.
- He should have clear information regarding the market conditions as well as about the ruling prices, otherwise may be cheated. There should be organized and regulated markets where the farmer will not be cheated by the -dalals- and -arhatiyas-
- The number of intermediaries should be as small as possible, so that the middleman's profits are reduced. This increases the returns to the farmers.

Defects of Agriculture Marketing in India:

Agricultural marketing needs to come a long way and grow before it can meet the objective.

There is lack of proper and sufficient storing facilities for the produce. The storage facilities which are available in the villages at present are so bad and unscientific that 10 to 20 percent of the produce is eaten away by rats.

- The average farmer is so poor and indebted that he has no capacity to wait for better prices. He is forced to sell his output to the money-lender or to the trader so as to clear his debts. Such distress sales weaken the

- already miserable position of the average Indian farmer further.
- Different varieties of agriculture produce are not graded properly. The practice usually prevalent is the one known as **dara sales** wherein heap of all quantities of produce are sold in one common lot. Thus the farmer producing better qualities is not assured of a better price. Hence there is no incentive to use better seeds and produce better varieties.
 - Transport facilities are highly inadequate in India. Only a small number of villages are joined by railways and pucca roads to mandies. Produce has to be carried on slow moving transport vehicles like bullock carts. Obviously such means of transport cannot be used to carry produce to far-off places and the farmers have to dump his produce in the nearby markets even if the price obtained in these markets are considerably low. This is even truer with the perishable commodities.
 - The chain of middlemen in the agriculture marketing is so large that the share of farmers is reduced substantially. For instance, a study of *D.D. Sidhan* revealed, that farmers obtain only about 53% of the price of rice, 31% being the share of middlemen (the remaining 16% being the marketing cost). in case of vegetables and fruits the share was even less, 39% in the former case and 34% in the latter. The share of middlemen in the case of vegetable was 29.5% and in case of fruits was 46.5%. Some of the intermediaries in the agricultural marketing system are – village traders, kutcha arhatiyas, pucca arhatiyas, brokers, wholesalers, retailers, money lenders, etc.
 - Even now the number of unregulated markets in the country is substantially large. Arhatiyas and brokers, taking advantage of the ignorance, and illiteracy of the farmers, use of unfair means to cheat them the farmers are required to pay arhat
- farmers obtain only about
53% of the price of rice, 31%
being the share of middlemen
(the remaining 16% being the
marketing cost).**
- (pledging charge) to the arhatiyas, "tulai" (weight charge) for weighing the produce, "palledari" to unload the bullock carts and for doing other miscellaneous types of allied works, "garda" for impurities in the produce, and a number of undefined and unspecified charges. Another malpractice in the mandies relates to use of wrong weights and measures in the regulated markets. Wrong weights continue to be used in some unregulated markets with the object of cheating the farmers.
- Finally, the farmers do not ordinarily get information about the ruling price in the big markets. As a result the farmers have to accept whatever price is quoted to them and have to believe what ever the trader tell them.
- Setting up of the Regulated Markets:** A very important step taken up by the government to improve agricultural marketing has been setting up of regulated markets in the country. With the establishment of these regulated markets, the malpractices in mandies have disappeared and the market charges have been rationalized as much as 80% of agricultural produce is now sold in the regulated markets.
- Provision of Warehousing Facilities:** To prevent distress sale by the farmers, particularly, the small and marginal farmers, due to prevailing low prices, rural godowns have been set up. The government has done much to provide warehousing in towns and villages. The *Central Warehousing Corporation* was set up in 1957 with the purpose of constructing and running godowns and warehouses for the storage of agricultural produce. The states have set up the *State Warehousing Corporations* with the same purpose. At present the *Food Corporation* is constructing its own network of godowns in different parts of the country.
- Market Surveys:** the government has taken marketing surveys of various goods and has published these surveys. These surveys have brought out many problems connected with the

marketing of goods and have made suggestions for their removal. The government gives wide publicity to prices of agricultural goods in all major markets. With these information farmers can organize their work in accordance with the requirements of the markets. Consumers too will benefit from them.

Availability of credit: it is necessary to make arrangement to supply credit to farmers to tide over the period between production and sale of the produce. It is only when the farmers are able to meet the expenses for their daily requirements of life that they have sufficient holding capacity to make the best of market opportunities. Further, it needs to be stressed that the organization of credit should be such that the farmers feel no difficulty in taking his produce to the market and selling it freely. Cooperative credit societies are the best way to meet the requirement of the agriculturists. The most appropriate things to do would be to ensure simultaneous development of cooperative credit and cooperative marketing. *Credit should be linked with marketing arrangements.* At the time of extending credit, it should be seen that farmers sell their produce through cooperative marketing societies. This will ensure the return of the loan. At the same time it will be possible to direct the use of credit into productive channels. Considerable progress has been made in this sphere of credit.

Efficient Transport Arrangement: An essential requirement for improving India's marketing system is the availability for transport which can carry goods to markets at low cost, easily and speedily. For this purpose there should be all weather roads in villages. Besides, bullock-carts with rubber wheels and trucks run on petrol and diesel are needed. Rail and water transport should also be further developed, keeping in view the special features of agricultural goods.

Uniform and Standard Weights: the need for using uniform weights throughout the country is obvious. Lack of uniform standard of weights will continue to keep marketing in an unsatisfactory state. unscrupulous traders alone can benefit from this state of affairs.

To improve upon this aspect of marketing, the government has been making efforts over a last many years .as far back as 1939 the *Standard Weight Act* was passed, under which the state government made efforts to promote the use of standard weights. Later on, with the view to introducing uniformity in weights, the government enacted legislation and prepared a time-bound programme to introduce the *metric and decimal system* in the country. Since 1962 the use of metric weights has been made compulsory. In view of the use of the metric system of weights, the situation in this regard has considerably improved.

Future Trading: As part of economics reform, the government has permitted the resumption of future trading in gur, potato, castor seed, pepper, turmeric and hessian. During 1997-98 budget, the government extended future trading in coffee, cotton, castor oil and jute goods. In 1998-99 budget, the government announced future trading in oilseed, oilcakes and edible oils. The government has allowed international future trading in pepper and castor oil.

Grading and Standardization: the government has done to grade and standardize many agricultural goods. The *Agricultural Produce (Grading and Marketing), Act* was passed in 1937, under which graded goods are issued certificates of grades. Goods with such certificates are listed as "AGMARK". The government has setup grading stations for commodities like ghee, flour, eggs, etc.. A *Central Quality Control Laboratory* has been set up in Nagpur and eight other regional laboratories in different parts of the country with the purpose of testing the quality and purity of agricultural products applying for the government's "AGMARK" have been created. The government is further streamlining quality control enforcement and inspection and improvement in grading. The number of testing laboratories is being increased and programme of grading at producers' level is receiving greater attention especially for commercial crops.

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SPOT EXCHANGES AND ITS BENEFITS TO STAKEHOLDERS OF AGRICULTURAL MARKETS

Dr. N. Rangasamy

Spot exchanges are new electronic markets that make available benefits of online real-time trading with guaranteed clearing and settlement facilities to the commodity producers, including farmers, processors and also to various stakeholders of agricultural marketing. These exchanges are aimed at enhancing efficiencies of existing value chain of commodities by

- a. developing appropriate platforms for modern spot markets, i.e. spot exchange, e-mandi, e-linkage,
- b. financing of commodities based on credible warehouse management arrangements,
- c. reducing transaction charges,
- d. establishing benchmark prices for commodities, and
- e. supporting futures exchanges, regulators and the Government with standardized and structured spot markets for compulsory delivery in all agri-commodities.

The Government has allowed the National Commodity Exchanges to set up Spot exchanges in the country. After that, four National commodity

spot exchanges with electronic trading platforms were set up

Spot Exchanges role in marketing of Agricultural Commodities

At present, the spot exchanges offer trading in more than 30 commodities having delivery locations spread over 15 states. Spot exchanges electronically connect large numbers of buyers and sellers geographically located at distant places to converge on a single platform to overcome problems of time, distance, information flow and also provide guarantee for each trade market linkage among farmers, processors, exporters and users with a view to reducing the cost of intermediation and enhancing price realization by farmers. They also provide the most efficient spot price inputs to futures exchanges. On the agricultural side, the exchanges will enable farmers to trade seamlessly on the platform by providing real-time access to price information and a simplified delivery process, thereby ensuring the best possible price. On the buy side, all users of the commodities in the commodity value chain would have simultaneous access to the exchanges



and be able to procure at the best possible price. Therefore, the efficiency levels attained as a result of such seamless spot transactions would result in major benefits for both producers and consumers. These Spot Exchanges will also provide a platform for trading of Warehouse Receipts.

APMC (Agricultural Produce Market Committees)

APMCs are organizing trade for farm produce and providing marketing infrastructure to farmers. They set-up to provide a platform, where a farmer can sell his marketable surplus to traders, who in turn will sell to retailers and end users located in the vicinity. By design, market for agri-produce is conceptualized as a localized market and so, the concept of market area, market yard, etc. came into being, while for VAT and other taxes, entire state is considered as a market place. Hence, APMCs continued to be a localized market place, while in the meantime, commodity markets became pan India as well as global.

Linkages:

Linkage between APMCs and Spot exchanges

Model linkage suggested and operated by of National Spot Exchange Limited (NSEL) with APMCs

APMCs are connecting farmers to market through backward integration. Spot exchanges are connecting buyers located across the country through Electronic Terminals through forward integration. APMCs may become members of Spot Exchanges. Spot Exchanges may set-up its trading terminals at APMC market yard. Farmers bringing produce to market yard will be able to observe price in local auction vis a vis price prevailing on Spot Exchanges terminal. Wherever prices are high, they will sell their produce there. Spot exchanges may have its delivery center and payment counter at mandi yard itself, where farmer can deliver and get his payment, if he has sold on Spot Exchanges platform. If a farmer wants to avail loan against pledge of warehouse receipt, Spot Exchanges will facilitate the same. Spot Exchanges will collect mandi cess from buyers and pay to APMCs. Under this model, Spot Exchanges and APMCs will complement each other. This is the model linkage suggested and operated by National Spot Exchange Limited (NSEL) with APMC (Source: www.nationalspotexchange.com).

Linkage of Spot Exchanges with warehouses

Spot exchanges have warehouse facilities at important market locations which is also the exchange accredited delivery point. The exchanges accredited warehouses are hired or owned and managed by exchanges and approved by major financial institution for warehouse receipt funding. All these warehouses are well connected with road and have facilities of Weigh Bridge, transportation and labor. Exchanges provide the services of grading, quality certification and warehouse receipt funding. All these warehouses are open to the other physical traders/stockiest/farmers to store the commodities by paying rentals.

The advantages of the storing commodities in Spot exchanges accredited warehouses are:

- a. Availability of quality certification, grading, and transportation facilities
- b. Banks empanelled warehouse for warehouse receipt based funding
- c. Insurance of the stocks
- d. Warehouse linked with market to sell the commodity

A case of NCDEX Spot Exchange linkage with warehouse and trading process

A farmer/seller would bring the produce to the accredited warehouse. The warehouse would weigh the lot and assay it. After assaying, the producers are given a lot number for their produce. A seller can now put sale quote on the exchange. A buyer who has paid the margin money would put the buyers' quote. Trade happens on matching of buyers and sellers' quote. The buyer brings the balance amount of money on the settlement day. On receipt of the total amount, the exchange transfers the ownership of the goods to the buyer. The seller account is credited with the sale proceeds. The seller makes the invoice to buyer directly. The disputes if any are settled as per the exchange rules and the decision of exchange in this regard is final (Source: www.ncdexspot.com).

Linkage of Spot Exchanges with warehouses and banks

Spot exchanges have collaborated with different financial institutions to enable buyer and

sellers of the commodities to access institutional credit and warehouse receipt based finance through customization as per their requirement. The bulk buyer, exporters and traders who want to procure the commodities and require funds can approach the exchange with its requirement.

The main features of warehouse financing through spot exchanges are:

- i) Ease of availing the finance
- ii) Reduced documentation
- iii) Competitive interest rate
- iv) Quick processing and disbursal of loans
- v) Lower transaction costs for delivery and repayment of loan

Exchanges are providing the financial services to support procurement activities by the traders' and other institutional buyers so that the trade can be done seamlessly without any credit crunch.

Linkages of Spot Exchange with Warehouses and banks (Example of National spot Exchange Limited)

After harvesting farmers are bringing their produce to the accredited warehouses of National spot Exchange Limited. The exchange designated warehouses offer grading, quality checking and issue warehouse receipts to farmers. If price is unfavorable, the farmers produce may be stored in warehouses and they may obtain warehouse receipt. The farmers may approach NSEL authorized bank branch for warehouse receipt based loan. Commodity will be sold by the farmer during favorable price season through NSEL platform online and the entire loan amount and interest will be deducted from farmers account and the balance amount will be paid to the farmers. If prices are favorable to farmers, after grading, quality checking of produce, they will be issued warehouse receipts by warehouses and the produce will be sold on NSEL platform online and the farmers will receive immediate payment for their produce. This is the best example for linkages of spot exchanges with warehouses and banks.

Benefits of Spot Exchanges

Benefits to Farmers:

- i) Realizing the best possible price at the time of sale for agricultural produce

- ii) Trade and payment guarantee
- iii) Cost reduction in handling and other activities
- iv) Access to a national level transparent market, where direct selling to processors or end-users would be feasible
- v) Increase in holding capacity due to availability of warehouse receipt financing
- vi) Market intelligence reports

Benefits to Corporates, Processors, Exporters, Importers:

- i) Choice of e-trading platform as per their requirements
- ii) Facilitates bulk procurement operations without counter party and quality risks
- iii) Customized services relating to storage and logistics
- iv) Availability of professional services for grading and standardization
- v) Complete avoidance of hassles relating to physical market operations

Benefits to APMC Traders:

- i) Common national level platform for buying and selling of commodities
- ii) No counter party risk in trade
- iii) Procurement and disposal of huge quantity possible

Benefits to Futures Exchanges:

- i) Transparent spot market price source
- ii) Advantages to Arbitrageurs
- iii) Easy mechanism for sale of deliveries received on Futures Market
- iv) Advantage of cash-future arbitrage electronically

Benefits to Financial Institutions:

- i) Ready base of select producers for institutional linkages
- ii) Pledge finance to priority sector

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COMMERCIALISATION OF AGRICULTURE RUBBER PLANTATIONS

Dr. K. Baby

Commercialisation of agriculture which can be defined as a process where peasants start producing primarily for sale in distant markets, rather than to meet their own need for food or to sell in local markets, has taken place at different times in response to different stimuli. There are a number of factors affecting the commercialization process in agriculture. Some of them could be named as rapid growth of economies in the both developing and developed countries, introducing of new technologies, market expansion, market liberalization, urbanization, rapid increase of demand for food, decreasing of farming population, liberalized and open economic policies, bilateral and multilateral economic agreements, developed infrastructure facilities in farming areas and government agricultural policies. However, commercialization in agriculture is not a new phenomenon and it is not a surprise to the farming community. Since the nineteen fifties, farmers in most of the countries have moved towards commercial agriculture. Their major objective was surplus production aiming market prospects.

In the latter half of the 19th century a significant trend in Indian agriculture was the emergence of the commercialisation of agriculture. So far agriculture had been a way of life rather than a business enterprise. Now agriculture has began to be influenced by commercial consideration i.e., certain specialized crops began to be grown not for consumption in the village, but for sale in the national and even international markets. Commercial crops like cotton, jute, groundnuts, oilseeds, sugarcane, tobacco and rubber etc. were more remunerative than food grains. The cultivation of crops like condiments, spices, fruits

and vegetables could cater to a wider market. Perhaps, the commercialisation trend reached the highest level of development in the plantation industry i.e., in tea, coffee, rubber etc. which were all produced for sale in a wider market. A number of factors encouraged specialisation and commercialisation of the new market trend. The spread of money economy, the replacement of custom and tradition by competition and contract, the growth of internal and external trade, the emergence of a unified national market and the boost to international trade are the key factors for commercialisation trends in India.



Finance Capital and Commercialisation

For the Indian peasant, commercialisation seemed a forced process. To meet the excessive land revenue demand of the state and the high rates of interest charged by the moneylender, the cultivator perforce had to rush a part of his harvest into the market and sell it at whatever price it fetched. Many poor cultivators had to buy back after six months part of the crop they had sold away at low prices at harvest time. A number of factors like historical, economic and social served as a 'built-in depressor' and kept low the total agricultural output. In modern times underdeveloped and developing countries welcome an inflow of capital, enterprise, technology etc. from advanced countries to supplement domestic resources and initiate the process of economic development through commercialisation with the help of finance capital in all areas.

Economic Importance of Rubber

India is the third largest producer of rubber in the world. It is the fourth largest consumer of natural rubber. It is the fifth largest consumer of natural rubber and synthetic rubber together in the world. India is the world's largest manufacturer of reclaim rubber. India and China are the only two countries in the world which have the capacity to consume the entire indigenous production of natural rubber. Rubber is an important plant not only for world economic strategies but also for the use of living of humankind. The more social development, the more requirements of products made of rubber for people utilization is increasing every day. Natural latex is one of important raw material available for making various kinds of products in heavy industries such as motor and vehicle industry, kitchenware and house ware. In our daily life, we are always involving with products

made of Rubber. Remember that day today life of people in civilized countries is bound with Rubber from birth to death.

Rubber is significantly economic plant of India. Rubber tree, including seeds and plantation are beneficial for all kinds of use, increasing more income and employment opportunity for agriculturist. At present, Indian agriculturist are proud to have their plantation, increasing in total revenue every year. Plantation is easy to control and look after, save cost and time for its growth. Not like other plants, Rubber products have long been grown with its best outcome year after year. An estimated 60,000 hectares of land is now under rubber cultivation, and in the next five years, the area under the "liquid gold" cultivation would be doubled. India, Thailand and Viet Nam are among the largest natural rubber producing countries of the world.

Rubber Production in India

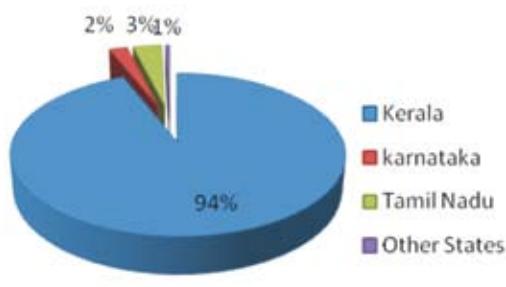
India is the third largest producer of natural rubber accounting for 6.5 per cent of the total world production. There has been phenomenal increase in the area and production of the rubber during last 45 years. The area has increased from 56,000 ha to 365,000 ha at an average annual rate of 11.7%, while the production has grown from 15,800 tons to 550,000 tons at an average annual rate of 72%. Kerala has almost monopoly in rubber production accounting for 94% of the country's output. Karnataka is the third largest producer of natural rubber in the country (area 2.70%, production 2.16%). Here Chikmagalur and Coorg districts are the main producers. A small production of rubber also comes from Tripura, Assam, Andaman and Nicobar Islands and Goa. Similarly its cultivation is also being promoted in non-traditional areas like Maharashtra, Mizoram,



Liquid Gold



Rubber Plantation



Manipur, Nagaland and Orissa. Tamil Nadu contributes 3.43 per cent of the total area and 3.39 per cent of the total production of rubber in the country. Here bulk of the production comes from the Nilgiris, Madurai, Coimbatore, Kanyakumari and Salem districts.

Production and Consumption Gap

India produced 54,000 tons of natural rubber (NR) during July 2014, markedly up from 46,000 tons produced in July 2013 when tapping disrupted by abnormal rains. The total output during the four months ended July 2014 was 221,000 tons, up 12.8% from the same period in the previous year. Preliminary estimate for August 2014 is 51,000 tons compared with 69,000 tons produced during the same month in the previous year.

The consumption sector improved during July 2014 as the country's rubber goods manufacturing industry consumed 88,400 tones of NR during July 2014, up 3.7% from 85,285 tones consumed in June 2014. The total quantity consumed during April to July 2014 was up 2.9%, year-over-year, at 338,985 tones. This represents a 2.4% rise in the dominant auto-tyre manufacturing sector and 4.0% rise in the general rubber goods sector. The country has consumed 85,000 tones of NR during August 2014, according to preliminary estimate.

The country imported 43,104 tons of NR during July 2014 making the total volume of import during the period from April to July 2014 at 139,896 tones as against 90,580 tons imported during April to July 2013. As regards export of NR, the period from April to July 2014 showed a fall to 155 tons from the corresponding volume of 2,083 tons exported during the same period in the previous year. The closing stock estimated for July 2014 is 192,000 tones, compared with the corresponding quantity of 178,000 tons a year ago.

Coming to Synthetic Rubber (SR) sector, the domestic production rose 37.3% on year to 49,205 tons during the period from April to July 2014. The consumption rose 8.8% during the same period to 175,210 tones.

Rubber Consumption in India

Consumption	Percentage
Automotive type sector	50
Bicycles tyres and tubes	15
Footwear	12
Belts and hoses	6
Latex products	7
Other products	10
Total	100

Source: Rubber Board India

Indian Rubber Market

India's production varies between 6 and 7 lakh tons annually which amounts to Rs. 3000 crores. Seventy percent of the total rubber production in India is in the form of Ribbed Smoked Sheets (RSS). This is also imported by India accounting for 45% of the total import of rubber. The Indian rubber industry has a turnover of Rs 12000 crores. Most of the rubber production is consumed by the tyre industry which is almost 50% of the total production of India. Among the states, Kerala is the leading consumer of rubber, followed by Punjab and Maharashtra. The exports of Indian natural rubber have increased tremendously over the years and have reached 76000 tons in 2013-14. Though, India is one of the leading producers of rubber but it still imports rubber from other countries. At present, India is importing around 50000 tons of rubber annually.

Indian Rubber Industry

There are about 6000 units comprising 30 large scale, 300 medium scale and around 5600 small scale and tiny sector units. These units are manufacturing more than 35000 rubber products, employing more than 4 lakhs people, which also includes 22000 technically qualified support personnel, contributing more than Rs. 40 billions to the National Exchequer through taxes, duties and other levies. The Indian Rubber Industry plays a vital role in the Indian national economy. The rubber plantation sector in India produces over 630 hundred thousand tones of natural rubber and there is a projected production of more than one million tons in near future. This

has helped in the radical and rapid growth of the Indian rubber industry. This prospect of growth is further enhanced by a boom in the vehicle industry, improved living standards of the people and rapid over-all industrialization. The per capita consumption of rubber in India is only 800 grams compared to 12 to 14 kg. in Japan, USA and Europe. So far as consumption of rubber products is concerned, India is far from attaining any saturation level. This is another factor leading to tremendous growth prospects of the industry in the years to come.

Natural Rubber (NR) Production

The production of natural rubber in the country was 9.14 lakh tones in 2013-14, marginally up by 10 thousand tons from 9.04 lakh tones produced in the previous year. The increase in production during 2013-14, despite a fall in the average yield, was contributed by the expansion of yielding area to 504,000 hectares in during the year from 490,870 hectares in the previous year. The average yield, measured in terms of the production per hectare of yielding area, declined to 1813 kg during the year from 1841 kg in the previous year due to adverse climate coupled with farmer's short run responses to fall in prices. Low rubber prices often compel farmers to reduce frequency of tapping and application of inputs. The total consumption of natural rubber in 2013-14 was 9.72 lakh tones with a growth of 0.8 per cent as against 9.64 lakh tones during 2012-13. The import of Natural Rubber in the country up surged to 2.17 lakh tones in 2013-14 from 2.14 lakh tones in 2012-13 while export of NR during 2013-14 declined to 30.5 thousand tones. Meanwhile in Kerala the production increased to 8 lakh MT and area to 5.45 lakh hectares. The global Natural rubber production in 2013 was estimated at 113.3 lakh tones via –a viz 111.1 lakh tones in the previous year. All the major producing countries except Malaysia reported increase in crop owing to better growing conditions and area expansion. The declining price of rubber is a cause of concern. A revival of rubber prices is expected consequent to the revision of import duty and other measures announced in 2013-14 by Government of India.

Rubber Production in Kerala

Kerala is the foremost producer of natural rubber accounting for 89.21 per cent of the total

area and 91.68 per cent of the total production of rubber in the country. Kerala state is leading rubber plantation state in India. Most of the Malanaadu and Idanaadu areas of Kerala state are growing rubber. Kottayam, Kozhikode, Ernakulam and Kollam and Palakkad districts are the main producers. Most of the production is raised from small holdings (less than 2 ha). There has been rapid increase both in the area and production of the crop during last three decades. Years back people used to plant coconut in their fields. But today people plant rubber trees instead as it gives a daily income. Researches made at the research centre at Puthuppally, in Kottayam District have produced good verities of rubber plants giving a very good yield. This plant which was brought to India during the British rule has spread all Kerala and other parts of India and providing daily income to the growers as well as the workers. With presently rapid growth, most of countries are improving and expanding their business in the field of agriculture, heavy industrial factories and commercial industries.

Conclusion

With nearly half the plantation area in the country and a major interest in all the four crops-tea, coffee, rubber and cardamom-Kerala is undoubtedly India's most important plantation state. These plantations ensure better return to growers, higher revenue to the Government, improved income to farmers, workers and above all the overall development of the economy. Among the various categories under the non-food grain sector, plantation crops have recorded the maximum growth in area during the period 1970's onwards as revealed by the enormous increase in their area index from 95.04 to 181.26. Plantations are agro-industrial undertakings regularly employing a large number of workers and are mainly concerned with production for commercial purposes. With one third of Kerala's State Domestic Product (SDP) coming from the agricultural sector, the role of plantation crops in its; agricultural economy may be viewed in terms of - share in cultivated area, contribution to state agricultural income; share of foreign exchange earnings, contribution to the state's tax revenue; and employment potential.

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IMPACT OF COMMERCIALISATION OF AGRICULTURE IN KERALA

Sumathy M, Manju Varghese, Smitha P

In India, agriculture is always considered as the mainstay of the large number of population. It directly or indirectly contributes fairly to the livelihood of the rural masses as a whole. Agricultural products are mainly divided as food grains and non-food grains. Food grains consist of rice, pulses, cereals, wheat etc. and non-food grains consist of tea, coffee, rubber, coconut and all other plantation crops. India's position in the world agriculture in 2010 was second in paddy, first in pulses, second in fruits and vegetables in case of non-food grains, second and third in the production of sugarcane and tea. Second and third in the production of cotton and tobacco. Average growth rate of food grains in 2000-01 was 1.01% and non-food grains was 0.66%. It was 2.89% and 1.96% in 2011-12. The per capita availability of food grains per annum in 2001 was 151.9kgs and in 2011 it was 169 kgs.

The trend of food grains and non food grains in India were shown in the following table.

From the data it was clear that the production of both food grains and non-food grains increased from year after year. During the 1950s and 1960s the production was sufficient to meet self consumption and after that production is not only meant for consumption but also for market. During 1950-51 food grain production was only 50.82 million tonnes and it was increased as 255.36 million tonnes in 2012-13. The production of pulses increased from 8.41 to 18.45 million tonnes. Oil seeds increased from 5.16 million tonnes to 31.01 million tonnes. Sugar cane increased from 57.05 million tonnes to 338.96 million tonnes. All these data shows that there was a steady increase in the production of food grain to non-food grain production.



From the table it is clear that compared to foodgrains, the area, production and yield of non foodgrains were higher. During the last twenty years the relative area under food grains as a group declined and that under non – food grains increased. In most states food-grains occupy more than 65 per cent of gross cropped area with the exception of Kerala and Gujarat.

Kerala Scenario

The agricultural wealth of Kerala is one which exhibits astonishing diversity. The bio physical resource base and agro-climatic endowments provide multiple opportunities for raising a wide range of crops. The plantation sector comprising rubber, tea, coffee and cardamom is the highly cash rich segment with in the agricultural sector in Kerala. The state accounts for 45% of total area under plantation crops in the country and they together account for 28% of the net cropped area of the state. Kerala is one of the few states in India where all the four plantation crops are raised in sizable quantities. Nearly 14 lakh families are dependent on the plantation sector for livelihood. Plantation sector are mainly export oriented. An important feature in the pattern of agricultural development is the shift in the cropping pattern in favor of commercial crops . Food crops, largely the small farm sector, unable to with stand the

domination of commercial or plantation crops. The recorded chronology of plantation crops in Kerala indicates that organized commercial cultivation of plantation crops in the state started in the order of coffee, cardamom, tea, and finally rubber. Commercialization was initiated in Kerala with the setting up of large scale plantations by the metropolitan powers. A remarkable feature of cropping pattern favoring non-food crops especially coconut and rubber.

‘One of the major changes that has been taking place in Kerala is the gradual shifting of areas from food crops like rice and tapioca to plantation crops like rubber, coconut, cashew and coffee. The relative position of pepper, tea, areca nut and ginger have mainly stabilized with slight decrease from the base period. To a large extent this switch over to high value crops for optimizing income from the limited land resources”.

The production of food crops (paddy and tapioca) has declined mainly due to decrease in the area of cultivation. The production of rice has continued to decline. The tapioca production too has declined due to the reduction in area. However during 2004-05 rice production increased from 5.70 lakh metric tonnes to 6.67 lakh metric tonnes an increase of 17 per cent during this period compared to a reduction of 17 per cent in 2003-04

Production of Major Agricultural Crops (Million Tonnes)

Sl. No	crops	1950-51	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2011-12	2012-13
1.	Food grains	50.82	82.02	108.42	129.59	176.39	196.81	244.49	259.99	255.36
2.	pulses	8.41	12.70	11.82	10.63	14.26	11.08	18.24	17.09	18.45
3.	oilseeds	5.16	6.98	9.63	9.37	18.61	18.44	32.48	29.80	31.01
4.	cotton	3.04	5.60	4.76	9.37	9.84	9.52	33.00	35.20	34.00
5.	Jute Mesta	3.31	5.26	6.19	8.16	9.23	10.56	10.62	11.40	11.30
6.	Sugar cane	57.05	110.00	126.37	154.25	241.05	10.56	342.38	361.04	338.96
7.	tobacco	0.26	0.31	0.36	0.48	0.56	0.34	0.88	0.82	

Source: Agricultural Statistics (2013)

with that of 2002-03. The un-precedent drought in recent years has contributed to this decline of paddy production during 2003-04, which was reversed in 2004-05. Tapioca production declined to 2.43 lakh metric tonnes from 2.54 lakh metric tonnes in 2003-04. Rubber, tea, coffee and cardamom are the principal plantation crops cultivated in the State. Both in terms of production and productivity performance of rubber in the State has been outstanding. Between 1974-75 and 2004-05 area under rubber more than doubled and productivity also doubled more than the base year values. At the beginning productivity was 601 kilograms per hectare reached 1437 kilograms per hectare in 2004-05. In terms of tapping area productivity recorded was 1715 kilograms per hectare during 2003-04.

As a result of commercialization production of both food and non-food crops were increased. Compared to the food crops the production of non food crops were higher. This was shown in the following table

Production of Important Crops in Kerala 2001-02 To 2011-12

Crop	Production (in tonnes)		% variation
	2001-02	2011-12	
paddy	703504	568993	-19
tapioca	2455880	2547399	5
coconut	5479	5941	8
pepper	58240	37501	-35
cashew	65867	36743	-44
rubber	580350	798940	38
groundnut	1812	2152	19
sesamum	284	76	-73
cotton	6069	640	-89
pulses	6281	3128	-50
ginger	40181	37125	-8
turmeric	7895	7946	1
banana	375903	514054	37
tobacco	395	37	-91
Total cereals	708624	569891	-20
coffee	66690	68175	2
tea	66090	57904	-12
arecanut	84681	121623	44

Source: Agricultural Statistics (2013)

Evaluation

Commercialization is a multifaceted phenomenon with its orientation depending on the technology, policies and the location-specific objective conditions. In a nutshell, it refers to production with a market-orientation. The transformation in agriculture during the last three decades, suggests that our agriculture has acquired commercial characteristics on a significant scale.

Change in the Crop-mix

Agriculture experienced significant shifts in cropping pattern towards the non-food grains crops over time. Traditionally, non-food grain crops such as oilseeds, fibers, narcotics, beverages, spices, condiments, sugarcane and rubber had been considered commercial crops as they were essentially produced for the market.

During 2011-12, the area under rice declined by 5027 ha. In the case of pepper, the area declined from 1.7 lakh ha in 2010-11 to 0.9 lakh ha. in 2011-12. Area under coconut was 7.7 lakh ha in 2010-11. But it increased to 8.2 lakh ha during 2011-12. All the major crops except rice and pepper showed increase in area in 2011-12. Similarly production of all major crops increased in 2011-12 except pepper. Substantial increase in production of rice is reported to the tune of 9 percent in 2011-12. In the case of coconut 12 percent increase in productivity is also reported. With the use of the index numbers it is easier to know the trends over time with respect to area, production, productivity of prominent crops. Index of area under food grains reveals again a declining trend. The deteriorating trend is more visible in the case of cereals. Area under pulses also shows a consistent fall during 2010-11 and 2011-12 periods. Despite of it, production and productivity levels improved in the respective periods. Area under coconut, plantation crops, vegetables and fruits, cashew and tapioca shows an increasing movement. Index of production of all these crops are expanded during the period. The productivity index of cashew fell drastically during 2011-12 due to rise in area coupled with comparatively small increase in production.

Farm size

Out of a total geographical area of 38.86 lakh ha.net sown area is about 53 per cent. The net sown area has declined by 1.5 percent in the current year over 2010-11. The share of total cropped area in the total geographical area is 68 percent. It marked an increase of 14296 ha during 2011-12 over the previous year while the net area sown declined by 31375 ha over the previous year. The share of land under non-agricultural uses out of total geographical area is 10 per cent in 2011-12. There is an increase in the area under current fallow (1028 ha) and increase in the area under fallow other than current fallow (5727 ha) during 2011-12. The area under cultivable waste also increased by 3772 ha and barren and uncultivated land declined by 2021 ha.

Diversification of Agricultural Sector

There has been a marked change in the relative shares of sub-sectors within the agricultural sector signifying diversification. Compared to 2010-11 there was increase in the price of all categories of meat except broiler chicken during 2011-12. During 2011-12, the highest increase was in the case of Mutton (18.9%), followed by pork (10.4%). Compared to 2010-11, the price of fowl-white egg increased by 4.2 per cent, brown egg by 8.8 percent and duck egg by 6.2 per cent during 2011-12. Corresponding increase during the previous year was 8.3 percent 14.8 percent and 14 percent respectively. The current level of inland fish production is to the quantum of about 1.40 lakh tones, an increase of 13 percent of the previous year. Fish production in 2011-12 was 6.93 lakh tones. Compared to previous year, the price of gingery oil cake increased by 4.4 percent, coconut oil cake by 13.2 percent, straw by 21.2 percent, ground nut cake by 15.7 percent during 2011-12

and the increase in the price of inputs is a serious threat to dairy farming.

The coverage of the plantations forestry is to the extent of 13.2 percent of the total area. The quantity of timber production in 2011-12 was 17283.2 cum (round log). The number of bamboos and reeds produced were 4.7 lakh and 93.9 lakh respectively. The sandal wood production was 52104.1 kg.

Inputs Use

The commercialization process has been palpable on input front as well. The share of purchased inputs, viz., fertilizers, electricity, diesel, irrigation and pesticides in the value of total inputs used in agriculture increased. The ratio of agricultural inputs, including purchased inputs, to gross value of output showed similar trend.

Conclusion

Commercialization is the need of the hour. Increased rate of commercialization can make agriculture self sufficient and sustainable. Commercialization resulted in crop diversification, mechanization, change in crop mix and also increased the use of land size etc., but Commercialization resulted in a favorable wave of non agricultural food grains. The development and growth of food grains is also very essential to meet the daily requirements of the nation. Increase in non food grains our country can earn more foreign exchange and achieve better growth of development. To meet the needs of growing population it is essential for increasing food grains production. So a balanced Commercialization of all sectors has to be promoted which results in overall development.

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MAKING A FARMER AN ENTREPRENEUR

Dr. Parveen Kumar

Today when our farmer is unable to make both ends meet making an agriculturist into an entrepreneur can create huge income -generating opportunities. Unfortunately we have not been able to make agripreneurs.

In a country where vast majority of the population is dependent on agriculture directly or indirectly, the development of agro based industries is of immense importance. Today when our farmer is unable to make both ends meet, making an agriculturist into an entrepreneur can create huge income-generating opportunities. It offers opportunities for becoming autonomous income generating units and thus becoming job providers than job seekers. Unfortunately we have not been able to make agripreneurs.

Agriculture offers varied ways for promoting rural industries can also serve as a feeder for the macro industries that operate at a much larger scale. Agro industries vary from those operated at the village level by individual farmers to small scale to those operating at a larger scale involving high investments. While the village industries are owned and run by rural households with very little capital investment and a high input of manual labour such as making Pickle or Papad , the small scale industries are characterized by medium investment and semi-automation like the edible oils rice and wheat mills. Large scale industries are characterized by large investments and a high level of automation.

But the small scale industries those generally associated with agriculture are very important for a developing country like India where there is scarcity of capital but abundance of labour. The potential of small scale industries in providing employment can be gauged from the fact that they generate more number of employment opportunities per unit of capital invested. These use labour intensive techniques.

For every one lakh of fixed investments, these industries provide employment to 26 persons as against 4 persons in the large sectors. Agro industries, although considered to be an extended arm of agriculture, have not received attention at par with the agriculture sector. Agro industries help in processing agricultural products such as field crops, livestock and fisheries products and thereby converting them to edible and other usable forms. They produce both edible and non-edible things. However, edible products otherwise known as processed foods form a predominant segment.

Extent of food processing in India: While agriculture contributes about 14 per cent of India's GDP, the percentage of food processing and value addition is very low. In India only about two percent



of the food is processed. This is very low compared to developed countries where more than fifty percent of the produce is processed.

Only 15 per cent of all the milk produced is processed. If one were to spend a few hours in the food section of the Wal-Mart departmental store in a U.S. city, one would understand the depth and width of the market for processed foods. In India the highest processing is in meat products where 21 per cent of the meat products are processed. In poultry the percentage of processing is a meager six per cent. Small scale industries require less capital and provide quick returns on investment. These use local resources. These does not requires imports of machinery or raw material besides playing a complimentary role that is feeding large scale industries and are best suited for customized production i.e designing the product as per the tastes and preferences and needs of individual customers provide part time or whole time work in rural and semi urban areas.

Potential of Food Processing Industry:

The food processing industry in the country is estimated to be worth around US \$ 67 billion and employing about 13 million people directly and about 35 million people indirectly. According to the Confederation of Indian Industries CII, the food processing sector has the potential of attracting \$ 33 billion of investment in 10 years besides generating employment for 9 million men days. A study by McKinsey reiterates the importance of the food sector in India. It indicates that food in India has an economic multiplier of 2-2.5 which means that for every rupee of revenue from food, the economy at large gets Rs. 2-2.50. The Indian food processing industry is currently growing at 13% Compounded annual growth rate. With a huge production base, India can easily become one of the leading food suppliers to the world while at the same time serving the vast growing domestic market of over a billion people.

An average Indian spends around 53 per cent of his/her income on food. The large market size, the changing life styles and the increasing health consciousness all create incredible market opportunities for food producers, the processors, the technologists and service providers in this sector. What is needed is the correct post harvest practices such as good processing techniques, and proper packaging, transportation and storage. All this, besides creating employment opportunities for masses can play a significant role in reducing spoilage and extending shelf life. Food processing benefits all the sections of the society. It helps the farmers to have higher yield, better revenues and lower the

risks drastically, Consumers have access to a greater variety, better prices and new products. Ultimately the economy also gets benefitted with new business opportunities for the entrepreneurs and the work force gets employment. Therefore it is beyond any doubt that the development of agro industries can help stabilize and make agriculture more lucrative, profitable and create employment opportunities for millions both at the production and marketing stages.

Engaging Private sector: If the government has some constraints in processing and value addition of the food products than private sector too can also be engaged. A simple product like soya milk is not produced in adequate quantity. Likewise, fish and shrimp, which have good export potential, lack cold storage and modern processing facilities. While fish production is around six million tonnes a year the frozen storage capacity spread over 500 units is only one lakh tonnes. Yet another area is herbal medicine. The world over it is increasingly realized that herbal drugs do not have side effects. The private sector is yet to realize the full potential of agro industries. The global market is enormous for sugar, coffee, tea and processed foods such as sauce, jelly and honey. The market for processed meat, spices and fruits is equally large. Only with mass production aided by modern technology and intensive marketing can the domestic market as well as the export market be exploited to the fullest extent. The raw material and commodities produced and marketed in India are of a wide range such as paddy, wheat, rice, maize, sugarcane, potato, cotton, fruits, vegetables, flowers, spices, fish, poultry, tea, coffee, medicinal plant and honey. All these commodities are processed in one form or the other and consumed in huge quantities within the country and also exported. The industry has to be more supportive to local domestic products and at the same time government have to come up proactively with measures that supports and promotes organizations involved in the trade and export of different products like APEDA, MPEDA, Indian Institute of Foreign Trade, Tea and Coffee Boards, Cashew Export Promotion Council, Coir Board, Leather Promotion Council, Silk Board and Spices Board. With food processing, value addition in the agri sector is also vital for comprehensive development of the rural economy. When we add value to a product it means we are giving options to the consumers to choose from a wide range of products besides the additional income for farmers. Since the food processing industry creates jobs, demand for agri raw materials, leads to diversification and commercialization of agriculture, enhancing the incomes of farmers and creating surpluses for export of agro foods. The broad-based development of the food processing industry will improve both the social and physical infrastructure of rural India.

The Agri-clinics and Agribusiness Centers is also a noble initiative of the Government of India where young agriculture professionals after getting training from the recognized nodal training institutes located all over the country can set up their own income generating units. For this they are financially supported by the Banks.

Ministry of Micro, Medium and Small Enterprises (MSME):

The Ministry of Micro Small and Medium enterprises has a number of programmes to help the entrepreneurs and those who owe small businesses. To set up business, one can contact National Institute for Entrepreneurship and Small Business Development (NIESBUD), National Institute for Micro, Small and Medium Enterprises (NI-MSME), Indian Institute of Entrepreneurship (IIE) or the Development Commissioner (DC-MSME) for details about their respective programmes. Any existing entrepreneur who likes to improve his/her competitiveness can contact Development Commissioner, MSME for assistance. Anyone interested to set up a village industry or want to know more about Khadi or Coir Products can contact KVIC or Coir Board.

Ministry of MSME encourages and honors innovation and enterprise. The ministry works in close coordination with the respective state governments, industry associations, banks and other stakeholders through their numerous field offices and technical institutions to help these 'engines of growth' throughout the country.

Different Schemes for promotion of rural based industries:

National Manufacturing Competitiveness Programme (NMCP) Schemes Under XI Plan The Government has announced formulation of National Competitiveness Programme in 2005 with an objective to support the Small and Medium Enterprises (SMEs) in their endeavor to become competitive and adjust the competitive pressure caused by liberalization and moderation of tariff rates.

Micro & Small Enterprises Cluster Development Programme (MSE-CDP): Development Commissioner (MSME) launched MSE-CDP for holistic development of selected Micro and Small Enterprises clusters through value chain and supply chain management on co-operative basis.

Credit Linked Capital Subsidy Scheme for Technology Up gradation: The Scheme was launched in October, 2000 and revised with effect from September 29, 2005. The revision was done to facilitate Technology Up gradation of Micro and Small Enterprises by providing 15% capital subsidy which was 12% prior to revision on institutional finance availed by them for induction of well established

and improved technology in approved sub-sectors/products.

Credit Guarantee Scheme : Under this scheme Collateral free loans up to a limit of Rs.50 lakhs are provided.

ISO 9000/ISO 14001 Certification Reimbursement Scheme: Incentive Scheme of Reimbursement of expenses for acquiring Quality Management System (QMS) ISO 9000 certification/environment management (EMS) ISO 14001 certification to the extent of 75% or Rs.75,000/- whichever is lower.

MSME MDA - The scheme offers funding up to 75% in respect of to and fro air fare for participation by MSME Entrepreneurs in overseas fairs/trade delegations. The scheme also provide for funding for producing publicity material (up to 25% of costs)

Scheme of Micro Finance Programme - Creating self employment opportunities is one way of attacking poverty and solving the problems of unemployment. There are over 24 crore people below the poverty line in the country.

Besides there are other schemes of Ministry of Micro Small and Medium Enterprises:

- a. Scheme of Fund for Regeneration of Traditional industries
- b. Market Development Assistance on Production Scheme
- c. Prime Minister Employment Generation programme
- d. Product Development, Design, Intervention and Packaging
- e. Khadi Karigar Janashree Bima Yojana for Khadi artisan
- f. Scheme for enhancing productivity and Competitiveness of Khadi industries and artisans
- g. Workshed scheme for Khadi artisans implemented through Coir Board Regeneration
- h. Modernization and Technology Upgradation of the coir industry

For any type of industry and scale of its operation, it is necessary to produce high quality raw material. This call for educating the masses about latest technological knows how. It also calls for strengthening of the infrastructure like cold storage, improving the production process in the agriculture sector, relaxing or removing stringent laws and regulations, and ensuring reliable power supply. The outdated technologies which the peoples still use have to be replaced with the more efficient ones.

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MEASURES TO MAKE AGRICULTURE PROFITABLE

Ghanshyam Goel, Samrat Bandopadhyay

The Various measures taken for quality improvement and availability of essential factors like fertilizers, seeds, electricity and irrigation facilities for agriculture in order to make it a profitable business include the following:

The Government is implementing various Missions, Schemes and Projects which facilitate production, availability & distribution of quality seeds and fertilizers to farmers. The Government of India has launched a new schemes viz. Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY) which aims to provide reliable and adequate power supply to farmers by separation of agriculture and non-agriculture feeders and strengthening of sub-transmission and distribution infrastructure in rural areas, among others. Rajiv Gandhi Grameen Vidyutikaran Yojana for rural electrification will get subsumed in DDUGJY.

Water is a State subject; water resources/irrigation projects are planned, executed and maintained by State Governments from their own resources and as per their own priorities. Government of India provides financial and technical assistance to the States under Accelerated Irrigation Benefits Programme, Repair, Renovation and Restoration of Water Bodies Scheme and CADWM Programme, to enhance the irrigation potential of the country as well as to ensure its effective utilization. Financial assistance is also being provided to farmers for micro

irrigation and protected cultivation under various schemes viz., Mission for Integrated Development of Horticulture (MIDH), On-Farm Water Management (OFWM) under National Mission for Sustainable Agriculture (NMSA) and Rashtriya Krishi Vikas Yojana (RKVY). Assistance for micro irrigation is being provided under OFWM @ 35% for small & marginal farmers and 25% for other farmers for an area upto 5 ha per farmer. This assistance is 50% & 35% respectively in the areas covered under Drought Prone Areas Programme, Desert Development Programme and North Eastern & Himalayan regions.

For protected cultivation, assistance is being provided under MIDH @ 50 % for setting up green houses, etc. for an area upto 4000 square meters per farmer. State Governments are also promoting these technologies under RKVY.

The Government is implementing many Missions/ Schemes such as Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), Mission for Integrated Development of Horticulture (MIDH), National Mission on Oilseeds and Oil Palm (NMOOP) and Grameen Bhandaran Yojana etc. for raising investments in agriculture. In addition, Government has issued a framework for Public Private Partnership for Integrated Agriculture Development (PPPIAD) for using RKVY allocation for bringing greater association of private sector in agricultural development projects in the States.



Agriculture sector has been identified by Government as priority lending sector, which constitutes at last 18% of the total loan portfolio of the banks. Crop loans are provided to farmers at a concessional rate of 7% per annum with 3% interest subvention for timely repayment. Post harvest loan is also available to farmers on the basis of negotiable warehouse receipts for a period of six months on the same terms so as to prevent distress sales. Thus, crop loans are available to farmers at more favourable terms than loans available to industries sector. However, loans for post harvest management activities including marketing, processing etc. are available on rates decided by the banks concerned.

Government has also taken several fiscal incentive measures such as tax deduction, waiver/reduction of Excise Duty, reduction of Custom Duty on specific food items etc. with a view to encouraging the growth of food processing industries. Agricultural & Processed Food Products Exports Development Authority (APEDA) is also implementing various schemes for promotion of export of agricultural and processed food products.

To provide high quality seeds and fertilizers to farmers, details of various Missions, Schemes and Projects is as follows:

- a. **Mission for Integrated Development of Horticulture (MIDH)** envisages to promote seed production for vegetables and spices. Assistance is provided @ 100% of total cost to public sector. In case of Private Sector, assistance is 50% of the cost as credit linked back ended subsidy for a maximum area of 5 ha. per beneficiary.
- b. **Under the Sub-mission on Seeds and Planting Material (SMSPI) under National Mission on Agricultural Extension and Technology (NMAET),** number of programmes and activities are organized to develop/strengthen seed sector and to enhance production and multiplication of high yielding certified/ quality seeds of all agricultural crops and making it available to the farmers at affordable prices and also place an effective system for protection of plant varieties, rights of farmers and plant breeders to encourage development of new varieties of plants. Financial assistance/grants-in-aid is also provided to private/ public entities under the component 'Development and Strengthening of Infrastructure Facilities for Production and Distribution of Quality Seeds'.
- c. **The Krishi Vigyan Kendras (KVKs)** also organise quality seed production and distribution to farmers. During the last one year 1.57 lakh

quintal seeds of improved varieties and hybrids of cereals. Oilseeds, pulses, commercial crops, vegetables, flowers, fruits, spices, fodder, forest species, medicinal plants and fibre crops were produced and provided to 2.61 lakh farmers by KVKs.

- d. **Under the National Mission on Oilseeds and Oil Palm (NMOOP)** support is provided for purchase of breeder seeds, production/distribution of certified seeds, distribution of seek Minikits (Varietal Diversification) for demonstration of new technologies, seed infrastructure Development, Variety Specific Targeted Seed Production (VSTSP), planting material for oil palm and Tree Borne Oilseeds (TBOs), establishment of seed gardens of oil palm, maintenance cost for oil palm and TBOs. NMOOP also provides support for production of bio-fertilizers/ bio-agents, gypsum/pyrite/ liming /dolomite and construction of vermi-compost.
- e. **Under the National Food Security Mission (NFSM)** certified seeds of high yielding varieties/hybrids which have been released during last 10 years are distributed on subsidy to the farmers under NFSM. Micronutrients, soil ameliorants are provided to the farmers on subsidy under NFSM on rice, wheat, pulses, coarse cereals. Bio-fertilizer (Rhizobium/PSB culture) is given to the farmers under NFSM-pulses on subsidy.
- f. **Fertilizer (Control) Order, 1985** has been promulgated for regulation of quality of fertilisers. No person shall manufacture/import for sale, sell, offer for sale, stock or exhibit for sale or distribute any fertiliser which is not notified in the said Order or not of standard prescribed in the said Order. Samples of fertilizers are drawn periodically by notified fertiliser inspectors of State Governments to check their quality whereas in case of imported fertilisers, the fertiliser inspectors of the Central Government draw samples from ships/ containers for checking their quality.
- g. The Department of Fertilizers under Ministry of Chemicals and Fertilizers provides Quality Urea and 22 grades of Phosphatic and Potassic fertilizers to the farmers on subsidized rates strictly as per the stipulation under the Fertilizer (Control) Order (FCO), 1985.

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AGRICULTURAL DEVELOPMENT IN NORTH-EAST

Rimjhim Bordoloi

The North-Eastern Region of India has a total cropped area of 5.3 million hectares and a population of around 39 million. The region falls under high rainfall zone and the climate ranges from subtropical to alpine. The region is characterized by difficult terrain, wide variations in slopes, altitude, land tenure systems and diverse cultivation practices.

The region has subsistence agriculture with poor infrastructure like roads and markets. The infrastructure facilities like supply of input, marketing, institutional credit and extension services are inadequate. Majority of the population, predominantly tribal, is dependent on agriculture and land-based activities. The agricultural production system in the region is predominantly rain fed, mono-cropped at subsistence level. The high vulnerability to natural calamities like floods, submergence, landslides, soil erosion, etc. has resulted in low and uncertain agricultural productivity. The low utilization of modern inputs in agriculture has further reduced the ability of the farm households to cope with high risks in production and income.

The present study focused on evaluating the various features of agriculture and the problems it faces.

Summary of the findings:

A. Poor State of Agriculture in North-East

Agriculture is an important sector in the economy of the NER, with its share in State Domestic Product (SDP) ranging from 19 percent to 37 percent in different states. This contribution of agricultural sector in SDP has declined during the past three decades. The NER has an agrarian economy. However, compared to the total geographical area, the land available for agriculture is limited. The region has a forest cover of more than 67 per cent (ranging from 24.6 per cent in Assam to 93.7 per cent in Arunachal Pradesh) against the national average of 22.8 per cent. The North-East accounts for about 8 per cent of the total geographical area of the country but has only 3.4 per cent of the total land put under agricultural purposes (CMIE, 2007: 9–21).



The growth in productivity of major staple crop, rice, has been slower than that of population, which may lead to food insecurity in the region. Barring Assam, the entire region is food grain-deficit. The region produces nearly 5 million tons of food grains as against a demand of 6.7 million tons. This imbalance in food-security remains unabated due to slow growth in production as well as productivity of major food grains. This is shown through the following table

Table Annual compound growth rate (%) in rice production in NER: 1990-2003

State	Area	Yield	Production
Arunachal Pradesh	1.30	0.10	1.39
Assam	0.21	1.4	1.75
Manipur	0.11	0.83	0.94
Meghalaya	0.14	3.90	4.04
Mizoram	-3.05	3.80	0.75
Nagaland	1.97	1.91	3.88
Tripura	-0.15	2.42	2.27

Small and marginal farmers dominate the landholding pattern in the NER. More than 59 per cent of the farmers hold below 1 ha of land, and 80 per cent of them hold below 2 ha. The region is also characterized by a low proportion of irrigated area. Gross irrigated area (to gross cropped area) under all crops ranges between 5.5 per cent in Assam to 30.2 per cent in Meghalaya, well below the national average of 41.5 per cent. Investment in building irrigation capacity has been insufficient and ineffective, and the irrigation potential created has remained grossly underutilized down the years.

The use of agricultural inputs in the NER is also low compared to the rest of the country. Fertilizer used per hectare during 2004–05 was negligible in the region, especially in Nagaland (1.5 kg), Sikkim (2.8 kg), Arunachal Pradesh (2.9 kg); and ranged between 18 kg in Meghalaya and 60 kg in Manipur compared to the national average of 104.5 kg per hectare (Ministry of Finance, Govt. of India, 2007: 175). The share of agriculture in total electricity used is just under 1 per cent in all the North-Eastern states, except Tripura (18.7 per cent), as against the national average of 25.3 per cent.

B. Characteristics of Agriculture in NE:-

Agriculture is the main economic activity in the region. Its salient features are:-

1. Domination of a single crop: Rice is the major staple crop commonly grown in the region. Rice is a three-season crop, viz, autumn (*Ahu*), winter (*Sali*) and summer (*boro*) in Assam. A notable change in rice production system is the introduction of *boro* rice in Assam. *Boro* rice is a low risk option with yield 30 to 40 percent higher than the normal yield. It has increased cropping intensity, leading to a situation of surplus production in Assam.
2. Shifting cultivation: This primitive mode of agriculture is the most important characteristics of agriculture sector in the region. The system reflects a sort of community farming without heritable rights over the land. The practice starts with selection of forested land, clearing and burning of the forest before the onset of monsoon, planting of various crops in an intimate mixture by dibbling and harvesting. The land is abandoned after cultivation for a period of 2-3 years and cultivation is shifted to another site. The system faces criticism due to its low productivity and environmental diseconomies, but provides support to about 443 thousand *jhumiya* households. On account of diversified nature of the system, the *jhum* cultivation provides not only food security but also household nutritional security.
3. Crop Diversification: A large number of household in the region practices diversification of crops. High value crops like different fruits and vegetables, oilseeds, spices and nuts are also widely grown in the region. Fruits and vegetables occupy the second place (12% area share) next to rice. Interestingly, not only the area allocation is high, the proportion of households growing fruits and vegetables is also high. Area under other crops is also growing and the notable gainer include fibres, sugarcane, rubber, sericulture, coffee, arecanut and coconut. Floriculture is also expanding rapidly.

C. Problems and Constraints of Agriculture sector in North-Eastern region:-

1. Dependence on traditional agriculture: Sluggish growth of the agriculture sector in the Eastern region is mainly due to low irrigation coverage, erratic climate with deviations in rainfall of 20% or more every third year for

- the last thirty years or so, and, most strikingly, a very high degree of dependence on a single crop, namely rice, which occupies 93.5% of the foodgrains grown. Average farm size, irrigation coverage, average fertilizer consumption and power consumption in agriculture are all below the national average. Average fertilizer consumption in North-Eastern India is lowest of any Indian state. The cumulative result of these factors is low productivity and near stagnation or marginal growth in agriculture sector during the recent years.
- 2. Poor State of Infrastructure:-** The availability of basic infrastructure, such as roads, bridges, processing, marketing, storage facilities, in the NER is far below the national standards. The overall infrastructure index for the region (at 93) also falls short of the national average of 100. The only exception is Assam, which has an index of 104 . The dismal state of rural roads, obstructing the easy transportation of agricultural inputs/produce, poor connectivity with other parts of the country , weak infrastructure for post-harvest management and marketing linkages, lack of ancillary units and cold storages etc. all these factors have inhibited the growth of the agricultural sector in the region.
- The degree of electrification of villages in the North-East is almost at par with the national share (NER: 82.8 per cent; India: 84.4 per cent.) However, per capita consumption of electricity in the NER is much lower—100 KWH (kilowatt hours)/year against the all-India figure of 240 KWH/year. The ratio of surfaced roads to total road length in the NER is 0.27 against the all-India figure of 0.51 and road length per 100 sq km of area is 46 km in the North- East against 64 km for the nation. Investment in agricultural infrastructure from public funds was not substantial in the region. Investment in other equally important sectors, such as agriculture and allied programmes, was nominal. Social factors such as low literacy levels, lack of awareness about the benefits of modern high-value agriculture, inadequate training programmes for farmers, a sensitive law and order situation, increased corruption and criminalization of politics have also adversely affected the development of the North-East.
- 3. Lack of utilization of HYV seeds and fertilizer:-** The spread of HYV has been poor as evidenced from the fact that only 56 per cent of the rice area has been brought under HYVs in NE hill states against 74 per cent in the country. Of the total quantity of improved seeds required by the farmers, roughly 40 per cent is met from within the region leaving a gap of 60 per cent in its present requirement. This gap is very likely to widen over time, as the percentage of adoption is sure to increase in near future. Except Assam, organized seed production programme does not exist in any of the NEH states. The modernization process of the agricultural sector in these North-eastern states still remains largely backward.
- 4. Dissemination of information:** Agricultural Universities and other units of ICAR are operative in the region, but the existing system is not adequate to address the problems of agricultural and horticultural development. The extension system is also weak. Departments of Agriculture in most of the States do not have adequate manpower and infrastructure to address prevailing problems. Further, they suffer not only from weak extension support in physical terms, but also from absence of a well-tested and adaptable systems for transfer of technology. Absence of such systems create a major credibility gap in the viability of the technology developed at the research institutions, and therefore finds limited application.
- 5. Investment Capacity:-** The high capital cost involved in establishing an orchard or plantation as also setting up of required infrastructure is a major factor and a serious constraint in exploitation of the potential for in the North East. Variable cost is also high for vegetable and flower cultivation. The situation becomes all the more difficult in view of the large number of small holdings, owned by weaker sections, who have no means to invest, nor can afford the burden of credit even if available. Added to this is the long gestation period of perennial fruits and plantation crops before reaching the economic bearing age. In view of long gestation period, scientific management and high investment credit support is particularly crucial in horticulture sector.

6. **Marketing:** Marketing of produce is a major component of the total production system and has a major role to play in making this system viable. As witnessed in the recent past, farmers in the region are generating marketable surpluses, but in the absence of marketing infrastructure they are unable to get remunerative prices for their produce. Cooperative marketing is very weak in the North Eastern region. The entire marketing system is handled by commission agents. Fruits are mostly auctioned by the orchard owner to pre-harvest contractors resulting in low returns, which do not encourage investment to achieve higher productivity. By and large, the marketing system is oriented neither to the producer nor consumer, but to the middleman, who earns exploitative margins. Moreover, the long distances between production and consumption centers are also a disincentive to the producer.
7. **Land tenure system/ small operational holdings:** Community ownership of land in North East, ownership by the village chief and prevailing land tenure systems often act as a disincentive for sustainable development and maintenance of land for cultivation. In the plain areas, the average holdings are very small and unviable as sustainable economic units. Besides, tenurial relationships do not encourage adoption of technological advances and are often highly iniquitous. The success of land reforms in West Bengal is reflected in revitalization of the agriculture sector and urgently needs to be replicated in other States.
- Poor Credit facilities:-** Credit facility, which is considered as an important infrastructural facility required for development is very minimum throughout this region. Ground-level credit flow, and its horizontal and vertical spread in NER, is far from desirable.
- D. Recommendation:**
- To reap the benefits of the huge opportunities for societal welfare, the following strategies are suggested:
1. Soil and water resources of the region need to be properly inventorised, characterized and evaluated for appropriate uses.
 2. Watershed approach of soil and water conservation and development of land-based production programmes in participatory mode need to be propagated.
 3. Increase adoption of HYVs of rice specifically in Arunachal Pradesh, Nagaland and Mizoram.
 4. Increase agri-inputs in all the NER states
 5. Develop small farmers-oriented technologies;
 6. Expand area under *boro* rice in Assam, Manipur and other states as far as possible
 7. Promote aromatic rice like *kala joha*, or such varieties particularly in Assam, Manipur and Tripura.
 8. Develop market incentives in the region.
 9. For animal health improvement, research on disease control/health care, vaccine production, diagnostics, disease surveillance and monitoring are extremely important.
 10. Training to farmers and entrepreneurs at different levels along with better coordination between extension functionaries.
 11. Diversification of agriculture should be promoted through practising a synergized-mix of rice, pulses, oilseeds, horticulture, livestock and fishery.
 12. For efficient market system, entrepreneurship development is indispensable.
 13. Inadequate database is a serious constraint in the NER; it needs to be streamlined for an effective analysis of the agricultural economy.
 14. Considering the special nature and location of North Eastern States, emphasis should be on introduction of organic farming, use of bio-fertilizer and organic manure in these areas which in turn could be advantageous for export.
 14. Greater emphasis should be given for the increase in area under oilseeds and pulses especially during rabi and summer seasons which will lead to greater crop diversification.
 15. Adequate attention is also necessary for the strengthening and further development of storage facilities in these areas. Special attention is required for the marketing of commercial crops like jute.

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ROLE OF SOCIAL CAPITAL IN EFFECTIVE IMPLEMENTATION OF SAANSAD ADARSH GRAM YOJANA

Dr. Mahi Pal

Inaugurating the Saansad Adarsh Gram Yojana (SAGY) on 11th October, 2014, the Prime Minister laid out his dream of Adarsh Grams "as the nucleus of health, cleanliness, greenery and cordiality within community". The Prime Minister also observed that various schemes and programmes are being implemented in all the villages. But in some villages progress is visible whereas in most of the villages progress is not as visible. What are the factors responsible for the former villages are to be replicated in later villages? Examples of some villages of Gujarat, Maharashtra and Telangana were also cited where brilliant work has been done for making the village ideal.

The main reason for such an effort on the part of Panchayats , local institutions and villagers is the presence of the social capital (SC)in the villages, which is build up/created after a long efforts on the part of panchayats and their leaders. It may be said that there is direct relationship between presence of SC and effective implementation of programmes with

people' participation. It may be reminded to readers that a number of Committees including the Report of the Committee to Review the Existing Administrative Arrangements for Rural Development and Poverty Alleviation Programmes, 1985 (CAARD) have suggested restructuring the rural development administration. Yes, it may be. But other side of the phenomenon is that merely restructuring administration alone cannot deliver the goods in terms of eliminating poverty and accelerating the pace of rural development unless and until state's intervention is supplemented and complemented with social initiative and social mobilization by the civil society. The social capital, in this context, has become important for creating a visible impact in rural areas of the country for generating demand from grassroots for their development. In the context of SAGY where rural development programmes are tilted toward demand driven mode, this becomes more important.

The present article focuses on as how social capital fasten the process of village development



in the countryside and how Member of Parliament (MP) who is the main stakeholder in this regard can conserve, build and use SC for the entire development of the village as envisaged under the scheme. The article divided into two parts. Part I discusses the concept and meaning of SC and part II focuses how SC would auger the pace of development in the rural areas.

Conceptual Framework of the Social Capital

Before conceptualising the SC, let us comment on what is rural development administration which would be put into practice to implement the SAGY. Rural Development Administration may be defined as the staffing and organizational support at central, state, district, block and village levels for administrating various economic and social developmental schemes and programmes for reducing poverty and promoting rural development.

The concept of social capital (SC) has been evolving one. Different scholars have defined it differently. Robert Putnam, who may be said to be the father of the concept of SC, defines it as features of social organization such as networks, norms and social trust that facilitate coordination and co-operation for mutual benefits. It shows two dimensions of SC. First, is structural, which consists of associations, networks, roles, rules, precedents and the second is cognitive, which relates to trust, norms and beliefs. The cognitive elements of the social capital inclines a person towards collective action and the structural elements of SC facilitate such action. It is, in fact, a fact that whatever administrative arrangement is available at district, block and Gram Panchayat(GP) levels, is ineffective due to lack of effective demand or collective action from the rural people on account of latent or dormant social capital.

We learnt from the past that the community could not own the strategy, processes and outcomes about the implementation of rural development programmes. This was happened on account of lack of social capital. People were not organized to demand what type of developmental products they required. On the other side where SC exist the developmental products were designed

and delivered according to their needs and requirements. Now under the inspiring leadership of MPs, SAGY would lead to collective action for holistic development of rural areas .

Hence, how social capital can activate different stakeholders in general and GP level in particular for effective delivery of public goods and services to intended beneficiaries to make the village adrash as envisaged under the Yojana.

Existing Administrative Arrangement for Rural Development

The CARRD report has pointed out that the administrative failures may be due to the extent that what is given to the administration is itself not well conceived. In this context the critical importance of operationalising decentralized planning through some institutional mechanisms at the district and sub-district levels to formulate an integrated district/block/village development plan which would combine both the development and beneficiary aspects with a shared objective of holistic development of rural area. Articles 243G, 243W and 243ZD of 73rd and 74th Amendments have provided the legal arrangement for the decentralized planning at village, block and district levels.

The above provisions have sought to provide an enabling environment for various stakeholders to participate in decision-making from Gram Sabha to District Planning Committee. But unfortunately, the system provided by the Constitution has not been put into practice as various components of the social capital have not been activated. For instance, the meetings of the Gram Sabha, held regularly rarely. The position of the Sub-Committees, Standing Committees at different levels of the Panchayati Raj Institutions too are held rarely.

Besides, even the meetings of the Mahila Mandals, Youth Mandals, Kissan Clubs, Parent-Teachers Associations, SHGs, etc., too are held rarely. In other words, these institutions are in existence only for namesakes. Had the meetings of these institutions been held properly it would have not only made people's involvement possible but

rural development bureaucracy would also have been activated. Two factors have been responsible for such a plight of these institutions. First, there is no coordination between and among various institutions at the district and sub-district levels. Second, these institutions are themselves dormant. The social capital in the form of these institutions is in existence but not active. To put it differently, in case of the institutions which have been formed by the Government itself, coordination does not exist among them. Convergence takes place rarely, although there is a lot of literature on this. This may be due to lack of awareness and lack of interest on the part of those who are expected to operationalise these institutions.

There is a lack of interaction between elected representatives and personnel at different levels. If there is no regular interaction, it is on account of inactive social capital in the administration of the rural development programmes. The regular interaction, discussion, dialogue and seminars promote democratic participation of people in their development. This is the base of SAGY also. But it is not happening mainly due to lack of SC or dormant SC. It also shows lack of coordination between elected representatives and the officers of Line Departments. But there is no coordination and cooperation between and among bureaucracy also. Besides Line Departments, there are two main Departments, whose bureaucracy has been stationed at district and sub-district levels. Rural Development Department's bureaucracy comprises of the Project Economists, Assistant Project Officers and Project Officer of the DRDA/ Zilla Parishads. The Development and Panchayats Department's bureaucracy for example in Haryana state comprises of the District Development and Panchayat Officer (DDPO), Block Development and Panchayat Officer (BDPO), Social Education and Panchayat Officer (SEPO) and Gram Sachiv. There may be other nomenclature of district and sub-district level bureaucracy in the States. These implement schemes of rural development through the institutions of Panchayati Raj in the country side. But there is not much coordination between the officials implement rural development programmes and those who

work for Panchayats. This is due to the absence of or lack of SC at the field level.

In addition to above, there does not exist coordination and cooperation in the following:

- Elected Bodies such as Panchayats and Cooperatives
- Organisations at various levels
- Gram Panchayats and Gram Sabhas
- Gram Panchayats and Panchayat Samitis
- Panchayat Samitis and Zila Parishad
 - Bureaucracy
- Rural Development Department and Panchayats
- Rural Development Department and Line Departments
- Elected Bodies, Community-based Organisations, Non-Governmental Organisations and Bureaucracy.

How to make Rural Development Administration Effective for SAGY?

The prospects for effective implementation of SAGY largely depends on the proper coordination and cooperation among different stakeholders, which is possible through formation of social capital and activating dormant capital. In order to promote SC, there is a need for activating the following:

- Dormant Institutions (Village, Block and District Levels)
- Associations
- Community Based Organisations (CBOs)
- Self Help Groups (SHGs)
- Committees etc.

It may be mentioned that over a period of time the State has extended its hands by constituting and forming various committees and associations for collective action. But not much attention has been given to make them active perhaps assuming that if these institutions become active, these will question the accountability of the Officials and Non-Officials. Keeping in view the apathy of the administration, the role of an Agency is very

important in making SC active for in turn making Panchayats, local institutions and administration effective and responsive. Wherever, it has been involved in activating the dormant institutions, the rural development administration worked effectively.

Role of MP as the Agency

It is interesting to note that both administration and villagers want a person or organization as the trusted to an agency of the government or the civil society through whom they can approach each other for their needs. In the context of SAGY, MP would be agency which would be instrumental in galvanizing all stakeholders at micro, meso and macro levels towards activating, forming and sustaining SC and on the other side create an environment where administration will be at back and call of community and their representatives. When an MP would act an agency as envisaged under SAGY, the developmental activities would not only be cost effective but also be done in participatory mode because MP would be in the centre of all activities and would be acting as friend, philosopher and guide for the villagers.

It is clear from the above that the role of MP as an agency is very important in making the village as adrash ones by way of converging and integrating various activities and services at local level.

The MPs are expected to sit with villagers and discuss with them what are their strengths and opportunities build on them and while doing so weaknesses and threats would automatically be wiped out in the processes.

Conclusion

To conclude, it may be stated that the SAGY could be implemented more effectively if there is pressure from the people to get benefits from various developmental activities and programmes being implemented by the central government, state government and Panchayats in their respective areas. The pressure from the people could be generated by activating latent SC and building and sustaining SC for collective action in the villages. The Member of Parliaments could play an important role in this regard.

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ASH GOURD-THE A FUTURE VEGETABLE

Suhas G. Karkute and Sudhakar Pandey

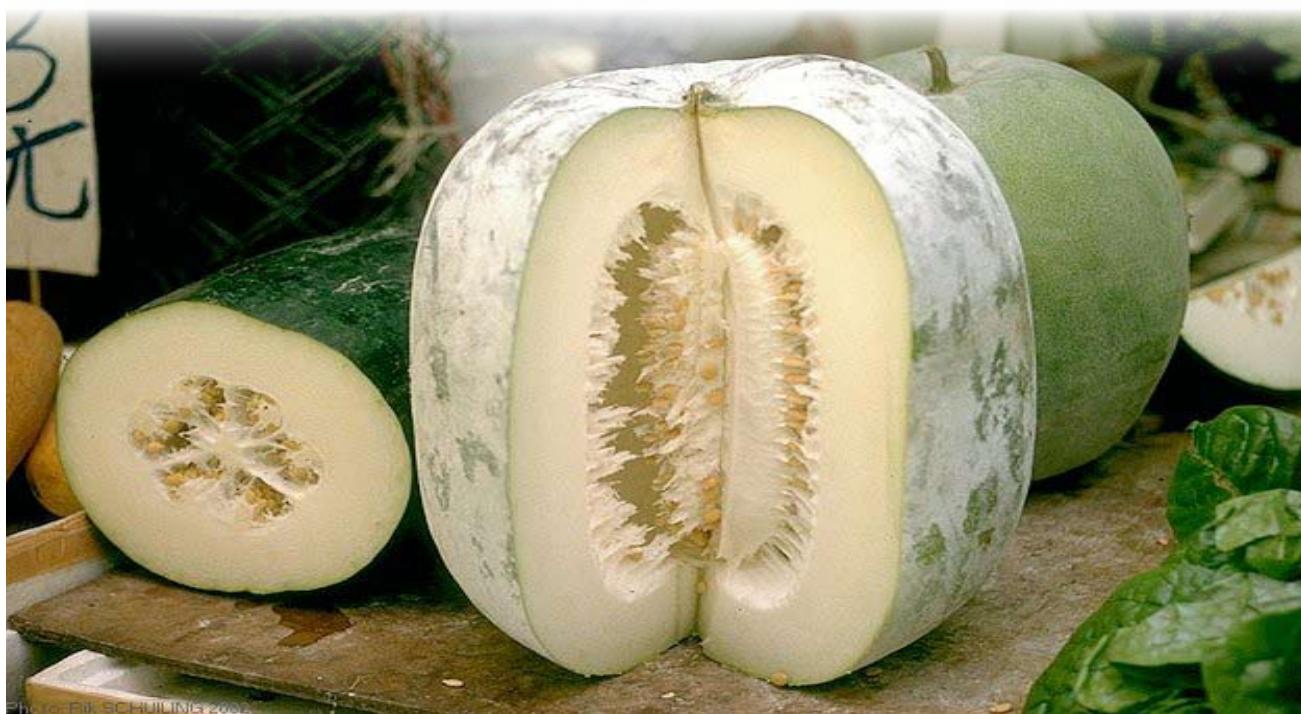
Ash gourd or wax gourd is nutritionally and medicinally rich vegetable fruit. It is one of the most important among cucurbits grown in Uttar Pradesh as it is raw material for petha industry and other parts of country for culinary and medicinal purposes. The petha industry provides employment to large population in northern part of Uttar Pradesh. Indian Institute of Vegetable Research successfully developed three varieties suitable for petha processing along with modified efficient petha processing method.

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Ash gourd is popularly known as winter melon, wax gourd, white gourd, Chinese preserving melon or white pumpkin. It belongs to a monotypic genus *Benincasa* of cucurbitaceae

family with a single cultivated species *hispida* (syn. *cerifera*). It is normally grown in South East Asia, China and India. In India, it is grown mostly in north Indian states namely Punjab, Uttar Pradesh, Bihar, West Bengal; northeastern hill (NEH) states; Orissa, Kerala and Tamil Nadu on commercial scale, however, it is grown sporadically throughout India.

Uttar Pradesh tops the list Marks under production among the states cultivating ash gourd. Compared to other cucurbits, yield potential of ash gourd is very high and its demand for petha processing industry in Uttar Pradesh helps farmer to fetch high price for their produce. Generally, yield of ash gourd is 35-40



t/ha but use of improved varieties with efficient agronomic practices and nutrient management, it has shown the yield potential of up to 100 t/ha. Hence, ash gourd is certainly an important crop to boost the economic gain for farmers through its cultivation.

Dietary importance

Large numbers of recipes of ash gourd are well known in India. The immature fruit is used as culinary vegetable in West Bengal, Orissa, Kerala, Tamil Nadu and NEH Region of India for preparing variety of dishes. In southern part it is an ingredient of "sambhar". It is also consumed by preparing curry. Fully ripened or mature fruits are used for preparation of *petha* (candy), sweet or *bari* in Uttar Pradesh. A healthy soup is prepared from ash gourd. Juice of ash gourd is a beneficial drink for good health. Seeds of ash gourd are also edible and possess medicinal properties. Thus, each and every part of the ash gourd fruit is utilized for consumption.

Nutritional importance

Ash gourd is a nutritionally rich fruit containing vitamins and minerals like calcium, potassium, iron and zinc which are essentially required in human diet.

Table: Nutrient content of fruit per 100 g of edible portion

Constituents	Contents	Constituents	Contents
Edible portion (%)	98	Sodium (mg)	2.0
Water (%)	93.8	Iron (mg)	0.4
Fiber (g)	2.9	Zinc (mg)	0.6
Protein (g)	0.45	Vitamin-A (mg)	0.02
Fat (g)	0.1	Thiamin (mg)	0.07
Carbohydrates (g)	3.0	Riboflavin (mg)	0.1
Calcium (mg)	36	Vitamin-C (mg)	13
Magnesium (mg)	15	Organic acid (g)	0.04
Potassium (mg)	250	Energy (kcal)	13
Niacin (mg)	0.4		

Medicinal importance

Ash gourd is mentioned in ancient Ayurvedic texts like *Charaka Samhita* and *Ashtanga Hridaya Samhita* for its many nutritional and medicinal properties. Ayurveda physicians call it kushmanda and a preparation with the fruit is called kushmandaavaleham. The raw fruit is useful for alleviating 'vatha' and 'pitta' while ripe fruit alleviates all three humours. The paste of the leaf or fruit is applied on burns and wounds to get relief. For relief from headache caused by vatha or pitta, apply seed oil on head. It is also useful in treating respiratory disorders like asthma, blood-related diseases, and urinary diseases like kidney stones. In the gastro-intestinal system, it acts as a laxative. The seeds are anthelmintic and have special effect on tapeworm. It is the best fruit for use as brain food to treat mental illnesses and nervous disorders such as epilepsy and insanity. Its high potassium content makes this

Gourd is a nutritionally rich fruit containing vitamins and minerals like calcium, potassium, iron and zinc which are essentially required in human diet.

a good vegetable for maintaining a healthy blood pressure. It strengthens a weak heart and lungs if taken as curry. Eating curry also helps in disurea (difficulty in passing urine) and reduces stones in the bladder. It is effective medicine for women suffering from excessive bleeding and excessive vaginal discharge. Its usual intake in diet increases the sperms and treats disorders or defects in sperms. Extract of ash gourd has acid neutralizing property and is recommended for management of peptic ulcer. Ash-gourd juice is used to treat diabetes and Cucurbitacin of juice had protective effect on kidney damage caused by poisoning of mercuric chloride. Besides these, it has the cooling effect on body and helps to induce healthy and sound sleep. The paste of fruit prepared with ghee is the excellent food for gaining the weight.

[Suhas G. Karkute is Scientist and Dr. Sudhakar Pandey is Senior Scientist, Indian Institute of Vegetable Research, Varanasi-221305].

HEALTH BENEFITS OF SPICES

Reena Chauhan, Kumara B.H and M.K. Rana

GARLIC contains 33 potent sulfur compounds, 17 amino acids, arginine, selenium and enzymes such as allinase, peroxidases, myrosinase. The sulfur compounds in garlic inhibit key enzymes that generate inflammation in body

Spices and condiments need no introduction since India is known the world over as the *Home of Spices*. Spices are defined as a strongly flavored or aromatic substance of vegetable origin, obtained from tropical plants and commonly used as a condiment. American Spice Trade Association (ASTA) defines spices as *any dried plant product used primarily for seasoning purposes*. The word *spice* came from the Latin word *species*, meaning specific kind. Spices constitute an important group of agricultural commodities, which are virtually indispensable in culinary art. Nobody can imagine food without spices. Right from the kitchen and medicinal uses in homes, spices have an important role to play in different places.

The basic effect of spices when used in cooking and confectionary can be for flavoring, deodorizing/masking, pungency and coloring (Table 1). The major color components of spices.

According to International Organization for Standardization (ISO), 109 spices belonging to 31 families are grown around the world, the majority of which are in Asia (Table 3). In India, about 52 spices are cultivated and classified in different ways. Based on plant part used, they are classified as (i) rhizome and root spices, (ii) bark spices, (iii) leaf spices, (iv) flower spices, (v) fruit spices and (vi) seed spices (Parthasarathy, 2008).

India is predominantly an agrarian country and the prosperity of its farmers brings prosperity to the nation. As India is blessed with a varied climate, each of its state produces one or the other spice. There is no other country in the world that produces as many kinds of spices as India. The Europeans came to the Indian shores lured by the spices grown here. Pepper, ginger, turmeric, and cardamom are the most renowned of Indian spices. In almost all of the states and union territories of



Table1: Use of spices

Basic functions	Spices as major function	Spices as sub-function
Flavouring	Parsley, cinnamon, allspice, dill, mint, tarragon, cumin, marjoram, star anise, basil, anise, mace, nutmeg, fennel, sesame, vanilla, fenugreek, cardamom and celery	Garlic, onion, bay leaves, clove, thyme, rosemary, caraway, sage, savory, coriander, pepper, oregano, horse radish, Japanese pepper, saffron ginger, leek and mustard.
Deodorizing or masking	Garlic, savory, bay leaves, clove, leek, thyme, rosemary, caraway, sage, oregano, onion and coriander.	Parsley, pepper, allspice, mint, tarragon, cumin, star anise, mace, fennel, sesame, cardamom, mustard, cinnamon, vanilla, horseradish, Japanese pepper, nutmeg and ginger
Pungency	Garlic, savory, bay leaves, clove, leek, thyme, rosemary, caraway, rage, oregano, onion, coriander, Japanese pepper, mustard, ginger and horseradish	
Colouring	Red pepper, paprika, turmeric and saffron	

Source: Ravindaran *et al.* (2006)

India, at least one spice is grown in abundance. Singhal in 2003 reported that India is the largest chilli producer with 40-50% of the output coming from Andhra Pradesh and meets one third of the country's need. Kerala is the leading producer of both black pepper and cardamom. About 80% of the world supply of coriander is produced in India, of which, Rajasthan alone accounts for 70%. Apart from adding colour, flavour and taste, the consumption of spices provide infinite health benefits. The therapeutic significance of some important spices is discussed below:

Turmeric (Haldi)



Turmeric, known as the *king of spices*, comes from the root of the *Curcuma longa* plant and has a tough brown skin and a deep orange flesh. Due to its

deep yellow-orange color, it is traditionally known as *Indian saffron*. It has a peppery warm and bitter flavor and a mild fragrance slightly reminiscent of orange and ginger and has been used throughout history as a condiment, healing remedy and textile dye. Its intense color makes it a front-runner in different food groups.

A magical compound curcumin, found only in turmeric, helps in reducing inflammation, blocks

the growth of certain kinds of tumor and also helps in treatin upset stomach, scabies, diabetes, HIV, uveitis and viral infections. Tumeric is rich in antioxidants, used for healing of wounds, to prevent the joint inflammation, Alzheimer's disease and to reduce liver damage caused due drinking of alcohol. The polyphenol curcumin is another useful component of turmeric and it has power to retard the growth of cancer cells causing prostrate cancer, melanoma, breast cancer, brain tumour, pancreatic cancer and leukemia. It also helps to relieve wound inflammation, arthritis and reduces cholesterol levels.

Fennel

Fennel is commonly found in India and popularly known as *saunf* or *mouti saunf*. It is used as a flavoring agent, preservative and in industries



like toothpaste, mouth freshener and flavoring compounds. The major component is anethole, which resists the activities like adhesive and invasive in cancer cells and suppresses its enzymatic activities. The fennel bulb is an excellent source of vitamin C, which is water-soluble in nature. It also contains small quantity of minerals such as copper, iron, calcium, magnesium, manganese, zinc and

selenium. It is also a good source of niacin and fibers that may help to reduce elevated cholesterol levels, removes maximum carcinogenic toxins from the colon and useful in preventing colon cancer.

Saffron



Saffron is known as the golden spice in the world due to its high prized spices. Due to its colour and flavor, it is mainly used in sweet dishes. It helps to

cope with skin diseases, cough, cold and asthma. Threads of saffron are used for the treatment of kidney, bladder and liver disorders and improve circulation to the organs of digestion, lower down the blood cholesterol and triglycerides among heart patients and skin lightening. It also contains a natural carotenoid dicarboxylic acid known as *Crocetin*, which act on cancer-causing elements. The economic part of saffron is stigma consisting many important volatile oils and the most essential is safranal, which gives distinct hay-like flavor. The other volatile oils are cineole, phenethenol, pinene, borneol, geraniol, limonene, *p*-cymene, linalool, terpinen-4-oil, etc. These active components have many therapeutic applications in medicines as antiseptic, antidepressant, antioxidant, digestive and anti-convulsant. Besides, it is also a good source of essential elements like copper, iron, calcium, potassium, manganese, selenium, zinc and magnesium. Saffron is also useful in menstrual cramps and premenstrual syndrome (PMS) in women. It prevents early orgasm (premature ejaculation) and infertility in men. It is used in various types of therapy like body healing, detoxification and in spas.

Cinnamon



In various cultures, cinnamon (*Cinnamomum zeylanicum* or *C. cassia*) is considered as a *wonder food* due to its active oil components

such as cinnamaldehyde, cinnamyl acetate and cinnamyl alcohol, that are beneficial for human health. These are long sticks used for preparing *masalas*, beverages, perfumery, toiletries and cosmetics. Due to its medicinal values that support natural production of insulin, it reduces blood cholesterol and has a regulatory effect on blood sugar. In a study, it was found that cinnamon reduces the proliferation of leukemia, lymphoma cancer cells, tumour growth and blocks the formation of new vessels in the human body. Cinnamon is a rich source of iron, calcium and fiber and it is a natural food preservative. Cinnamaldehyde, one of cinnamon's active oils, has been researched for its effects on blood platelets, its anti-clumping impact. It is also helpful in treating common diseases like muscle spasms, vomiting, diarrhea, infections, cold, loss of appetite and erectile dysfunction. According to a research, it may lower the sugar level in blood of people suffering with type-1 or type-2 diabetes.

Ginger

Ginger originated in China is used as raw or in powder form throughout the world. It is a very popular spice used to give flavour to food and has many medicinal properties. Due to this, ginger finds a special place in many traditional Indian and Chinese medicines. Its pungent aromatic smell is due to the presence of essential oils and phenolic compounds like gingerols, shogaols, zingerone, farnesene and small amount of β -phelladrene, cineol and citral. Gingerol, which helps in improving the intestinal motility, is used as anti-inflammatory, painkiller, antibacterial, and antipyretic, while zingerone provides pungency to ginger, which is effective against *E. coli* induced diarrhea, especially in children. Some of the studies show that it helps in reducing nausea, relieving migraine headache and digestive problems and is beneficial in cough and cold. It upgrades the medicinal qualities that help in lowering the cholesterol and killing cancer cells. Besides, it relieves arthritic and menstrual pain, upper respiratory tract infections and bronchitis. The antihistamine property of ginger helps in treating allergy, inhibiting airway contraction and protecting from peptic ulcer by increasing the secretion of mucus. It also helps in breaking

down the proteins in food. A teaspoon of ginger juice with honey is effective against sore throat. Fresh ginger juice mixed with fenugreek and honey is excellent remedy for asthma **and preventing morning sickness**. Generally, it helps in **treating nausea and vomiting. It aids in digestion and acts as antiflatulence and appetizer.**

Garlic

This miracle herb has been used as a medicine since time immemorial to prevent or treat various diseases and conditions.



Garlic belonging to onion family is used for culinary and various medicinal purposes. It is a common Indian spice, which is used to add flavor and aroma to the food items. Its cloves having pungent smell and spicy flavor are used in pickles and curries. Besides, along with ginger and other ingredients, it gives distinct flavor to the dishes. It has antibiotic property, which helps in coping with cough, cold, It contains 33 potent sulfur compounds, 17 amino acids, arginine, selenium and enzymes such as allinase, peroxidases, myrosinase. The sulfur compounds in garlic inhibit key enzymes that generate inflammation in body. Allicin, a vital sulfur compound, is known to have immense antibacterial, antiviral, antifungal and antioxidant properties. Allicin along with other compounds like ajoene and alliin, produces effect on circulatory, digestive and immunological systems of the body. These compounds help to induce relaxation and enlargement of blood vessels, which improve blood flow throughout the body. It also helps to prevent severe asthma attacks and reduce pain associated with osteoarthritis and rheumatoid arthritis.

Cloves

Cloves, which are the dried flower buds, are common and extensively used as spices in curries and also possess medicinal properties. The most valuable compound like eugenol gives flavour, strong aroma and prevents the blood clots. The other important constituents in this spice include essential oils like acetyl beta-caryophyllene, vanillin

and catecholic acid, tannins like gallotannic acid and methyl salicylate (painkiller), flavonoids like eugenin, kaempferol, rhamnetin and eugenitin and triterpenoids such as oleanolic acid, stigmasterol and campesterol. Inspite of all these, it is also a good source of vitamin K, B₁ (thiamine), B₂ (riboflavin), B₆ (pyridoxine) and C (ascorbic acid). Cloves are well known for seasoning as well as health benefits and used as a component in preparing remedies for many diseases like toothache, nausea, vomiting, cough and **cold**, sinusitis acne, flatulence and **stress**. It is also prominently used in Cigarettes to add flavour.

Asafetida (Hing)

Asafetida is available in three forms, i.e., tears, mass and paste. Raw asafoetida has a bad smell and bitter tastes that is why it is sometimes called *devil's dung*. It is used in almost all Indian cooking and pickles. It contains resin, gum, ash and volatile oil. According to studies, it has anti-carcinogenic properties and does not allow the malignant cells to grow. It also acts as an antidote if taken in equal quantity of opium ingested. According to a research carried out in Egypt, its anti-parasitic property is utilized in several genital tract infections and sexually transmitted diseases. There is some scientific evidence that the chemicals in asafoetida may help in treating irritable bowel syndrome (IBS) and in protecting against high blood levels of certain fats including cholesterol and triglycerides. Chemicals called coumarins in asafoetida can thin the blood.

Black pepper

Incredibly popular black pepper since ancient times is often referred as *king of spice*. It is an excellent source of manganese, iron, copper, vitamin A, C and K and dietary fiber (soluble and insoluble fiber). It has array of nutrients, i.e., carbohydrates, sugar, sodium, fatty acids, amino acids, flavonoids, carotenes and many more. Peppers have been in use since ancient times for its anti-inflammatory, carminative and anti-flatulent properties. The strong spicy taste of black pepper comes from volatile oils such as piperine present in it, which plays an important role in preventing cancers. In combination with turmeric, its anticancer properties are heightened. It helps in the prevention of diseases related to

the intestine and stomach and boosting the food metabolism. Its antibacterial property is used for treating respiratory disorders and it is very effective against obesity as it burns unwanted calories. It is sometimes applied directly to the skin for treating skin diseases like scabies and for treating nerve pain.

Anise

Anise is one of the oldest spices known to mankind. This herb is known for its flavor, and because of its carminative properties it is known as *Tut-te-See-Hau*, meaning it expels the wind. Its seeds have anethole, thymol terpineol, estragol, *p*-anisaldehyde, anise alcohol, acetophenone, pinene and limonene. Among these, the major component of anise is anethole, which is responsible for sweet and aromatic flavor. Anethole and some other compounds in anise seeds containing anti-spasmodic and carminative properties are useful in preventing the formation of gas. It is also a good source of B-group vitamins such as pyridoxine, niacin, riboflavin and thiamine. Vitamin B₆ helps in increasing gamma-aminobutyric acid (GABA) neuro-chemical levels in the brain. The chemicals present in anise seed have insecticidal properties. It is commonly used in alcohols, liqueurs, dairy products like gelatins, meats, candies and breath fresheners. It is an excellent remedy for asthma, bronchitis cough and digestive disorders such as flatulence, bloating, colicky stomach pain, nausea and indigestion. The essential oil of anise seeds has effect on estrogen and its water is helpful in relieving running nose in infants.



Peppermint

Peppermint is an herb, which has been known since antiquity for its distinguishing characters like aroma and medicinal value. This unique quality of mint is due to the presence of menthol. It has analgesic (painkiller), local anesthetic and counter-irritant properties. The leaves of mint are widely used as an additive for digestion, relaxing the muscular lining of digestive tract and relieving cramps. Rosmarinic acid, another important component of mint, is beneficial in asthma. It

helps in breathing easily by encouraging cells called prostacyclins. It is an excellent source of manganese, vitamin C, vitamin A and carotenoids like beta-carotene. Both vitamin C and beta-carotene seem to play a role in decreasing colorectal cancer risk. They are commonly found in herbal remedies meant to ease headaches, migraines, fevers, sore throats and in formulae used to treat sinus and chest congestion. According to *Ayurveda*, the patients suffering from irritable bowel syndrome (IBS) may also get relief. It also helps in eliminating toxins from the body, and its crushed leaves help in whitening teeth, combating bad breath and act as a blood purifier.

Cardamom

Cardamom, native to the evergreen forests, is commonly used in Indian cuisine. It is the oldest and popular spice of the world and the third most expensive spice after saffron and vanilla. The most important types of cardamom are green cardamom, black or brown cardamom and ground cardamom. It contains many chemical compounds, which are known due to their antioxidant, disease preventing and health promoting properties. Due to its therapeutic properties, it is used in *Ayurveda* for the treatment of diseases like mouth ulcers, digestive problems, etc. Its pods contain many vital volatile oils like piene, sabinene, myrcene, phellandrene, limonene, 1,8-cineole, terpinene, *p*-cymene, terpinolene, linalool, linalyl acetate, terpinen-4-oil, α -terpineol, β -terpineol acetate, citronellol, nerol, geraniol, methyl eugenol and trans-nerolidol. It is also an excellent source of iron, potassium, calcium, magnesium and many essential vitamins. It can improve the blood circulation, prevent convulsions and beneficial for asthma or bronchitis. Additionally, it is used for intestinal spasms, common cold and cough, irritable bowel syndrome (IBS), intestinal gas, constipation and liver and gallbladder complaints.



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GOOD GOVERNANCE INITIATIVES

Seema Gautam

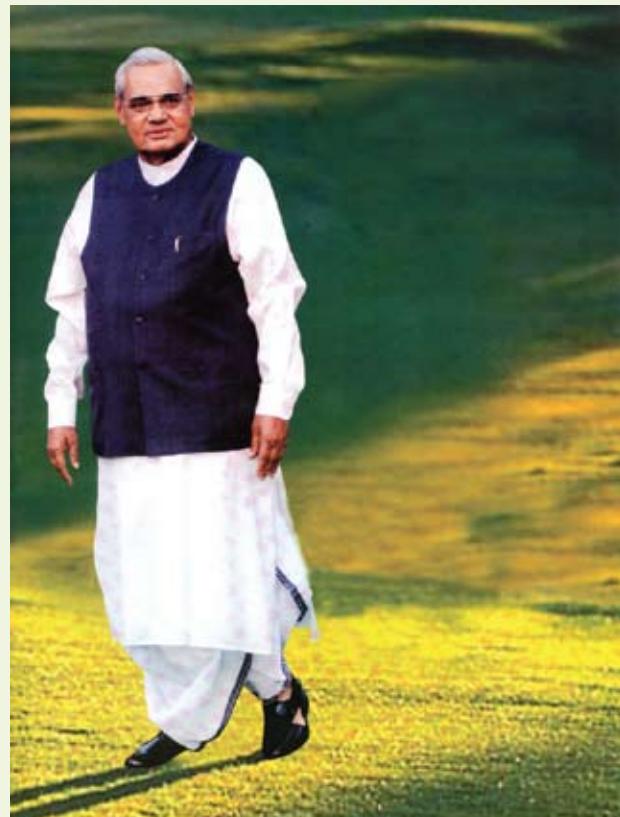
Every year, December 25 is a day of special occasion for the country as we celebrate the birthday of our former Prime Minister Atal Bihari Vajpayee. This year, the year was more special as the nation celebrated his birthday as 'Good Governance Day'.

Good governance is a critical factor in Indian context as majority of the population of our country lives in the rural areas. It is a challenging task to percolate the decision making in different layers of administration so that the benefit of development reaches the ultimate needy, living in each and every corner of this vast country. Good governance and creation of rural infrastructure were the key elements of the administration of former Prime Minister- Atal Bihari Vajpayee that accelerated the development in rural areas and the impact of these initiatives are visible now in the rural landscape of our country.

Atal Bihari Vajpayee has special love and affection for the rural people. He decided to make a home in a serene location of village Prini near famous hill station Manali which is located on the banks of the Beas river, on the Manali-Naggar road of Kullu district in Himachal Pradesh. The people of the village still remember his love and affection for them on each of his visit, even when he was Prime Minister of the country. His love to have a home at Prini was not spontaneous but reflects his great desire to transform the lives of the people in the rural India where majority of our population reside.



Village Prini Near Manali



During his tenure as Prime Minister of the country, he launched some historic initiatives for the rural India which had backing of almost all political parties of our country. Among such initiative, Pradhan Mantri's Grameen Sadak Yojana, Sarva Shiksha Abhiyan (SSA), Swajaldhara Scheme, Golden Quadrilateral project and Telecommunication revolution are notable ones which played a key role in creating rural infrastructure and capacity building of the rural people. In these major initiatives, first the Golden Quadrilateral project and the Prime Minister's Village Road Scheme were launched in 2003 ; second, in the education sector, Sarva Shiksha Abhiyan -Education for All campaign was launched in 2001; third, in the field of drinking water, the Swajaldhara scheme was launched in 2002 and in such measures, key policy reforms in telecom sector were implemented by the Atal Bihari Vajpayee government in 1999 that scripted India's Telecom revolution.

Roads

Pradhan Mantri Gram Sadak Yojana (PMGSY) is a flagship programme of rural connectivity which has major impact on rural economy. The programme is continuing and till now 3.9 lakh kilometres length of road has been constructed under this scheme with total expenditure of Rs. 2,15, 590 crores. The construction of PMGSY roads has led to certain interrelated changes of varying magnitude in the agricultural and allied sectors, which have economically benefited the villagers. These rural roads have had positive impact on the agricultural production as the farmers are getting better price for their produce, post-harvest losses have reduced and the famers have shifted to the cultivation of cash crops to tap the urban market. Better road connectivity has helped the farmers to fetch higher price per unit area of land and made them more prosperous. These roads have also made an improvement in the employment situation in terms of more job opportunities, more avenues for self-employment. There has been an increase in on-farm employment opportunities due to shift from grains to cash crops and also multiple cropping. In addition, more non-farm opportunities are available like opening of shops, small business and cottage industries. Moreover, road connectivity have made easy and prompt availability of health facilities.

Education

The Sarva Shiksha Abhiyan is a historic stride towards achieving the long cherished goal of Universalisation of Elementary Education (UEE) through a time bound integrated approach, in partnership with State Governments. SSA, which promises to change the face of the elementary education sector of the country, aims to provide useful and quality elementary education to all children in the 6 -14 age group. SSA was launched with the goal of universalising primary education by 2007 and elementary education by 2010. These deadlines were later extended to 2012. SSA was initiated in 2001 following recommendations from the state education ministers' conference in 1998. Although the 86th Amendment to the Constitution enacted in 2002 made elementary education a

fundamental right, the Right of Children to Free and Compulsory Education Act that operationalised the provision of free and compulsory education was not passed by the Parliament until August 2009. At the time of SSA's commencement in 2001 there were 3.40 crore out-of-school children between the ages of 6-14. Four years after the launch of SSA with more than 85 per cent of the funds utilised, 40 percent of the children (1.36 crore) remained out of school. Approximately Rs.57,000 crore has been allocated to SSA through union budgets from 1999-2000 to 2009-10. But, still the country needs to do a lot in the area of infrastructure development and in the form of qualified teachers and narrowing the teacher-student ratio to bring the country on the forefront on the global level. Because, according to the 'EFA Global Monitoring Report 2010' (UNESCO), India's rank was 105 among 128 countries.

Water

Swajaldhara project also is a critical input of every day life of the people in rural areas which has serious ramifications on the health of the people. This scheme was focussed aims to achieve self-sufficiency in drinking water in rural areas. The launching of *Swajaldhara* started with 882 projects covering 8 states with a total outlay of Rs.87 crores. In this scheme, proposals involved mini pipe water supply, bore well, tube well, water harvesting and rejuvenation of water bodies. This scheme has certainly made a good impact and the share of Indians with access to improved sources of water has increased significantly from 72 per cent in 1990 to 88 per cent in 2008. In addition, Vajpayee Government also took major initiatives to reform the telecommunication sector and such measures resulted in telecommunication revolution in the country.

Atal Bihari Vajpayee is a living legend of Indian democracy with far reaching imprints of development in the country, particularly in the rural landscape and celebrating his birthday as "good governance day" is a nice gesture for his governance.

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TRACING COMMERCIALISATION OF INDIAN AGRICULTURE

Dr. K. Kamar Jahan and T. Prakash

The British rule had a pronounced and a profound economic impact on India. Various economic policies followed by the British led to the rapid transformation of India's economy into a colonial economy whose nature and structure were determined by needs of the British economy. One of the important aspects of British economic policy was commercialisation of agriculture.

Commercialisation of agriculture simply implies that the agricultural crops and goods are produced by the peasants for sale in the market and not for their own consumption. Commercialisation of agriculture in India began during the British rule and took place not to feed the industries of India because India was far behind in industrial development as compared to Britain, France, Belgium and many other European countries of the eighteenth century.

Commercialisation of Indian Agriculture was done primarily to feed the British industries. For example, several efforts were made to increase the production of cotton in India to provide raw and good quality cotton to the cotton-textile industries of Britain which were growing fast after the Industrial Revolution in Britain. Therefore, cotton growing area increased in India and its production increased manifold with gradual lapse of time. Indigo and more than that, tea and coffee plantation were encouraged in India because these could get commercial market abroad.

Most of the plantations for commercial crops were controlled by the English. Jute was another product that received attention of the English company because the jute made products got a ready market in America and Europe. Commercialisation of agriculture was initiated in India by the British through their direct and indirect policies and activities.

Firstly, the new land tenure system introduced in the form of permanent settlement and Ryotwari Settlement had made agricultural land a freely exchangeable commodity. The Permanent settlement by giving ownership right to the zamindars created a class of wealthy landlords; they could make use of this ownership right by sale or purchase of land. Further, the agriculture which had been a way of life rather than a business enterprise now began to be practiced for sale in national and international market.

Moreover, crops like cotton, jute, sugarcane, ground nuts, tobacco etc. which had a high demand in the market were increasingly cultivated. The beginning of the plantation crops like Tea, coffee, rubber, indigo etc heralded a new era in agricultural practices in India. These were essentially meant for markets and thus commercialisation of agriculture took to new heights with the expansion of the British rule.

A large number of factors encouraged and facilitated commercialisation of Indian agriculture. The political unity established by the British and the resultant rise of the unified national market was an important factor. Further, the spread of money economy replaced the barter and agricultural goods became market items.

Also, the replacement of custom and tradition by competition and contract led to the commercialisation of Indian agriculture, which was also aided by the expansion of means of transportation and communication. The laying of railway lines and expansion of rail and road transport enabled the transportation of agricultural products from production centers to markets.

Another boosting factor for commercialisation of agriculture in India was the gaining of speed of Industrial Revolution in England. This led to factor in commercialisation as more and more agricultural goods were produced to satisfy the demand for raw materials by the British industries. The enlargement and expansion of international trade and the entry of British finance capital also belted commercialisation of agriculture.

This was especially so in cotton as the civil war disrupted the supplies of cotton from America and thereby increased demand for Indian cotton. Further, the British policy of one way free trade also acted as sufficient encouraging factor for commercialisation



as the manufactured items in textile, jute etc could find free entry in Indian markets, where as the manufactured goods did not have similar free access to European markets.

Commercialisation of agriculture was a forced and artificial process for the majority of Indian peasants. It was introduced under coercion of the British and not out of the incentive of peasantry at large. The peasantry went for cultivation of commercial crops under duress.

The peasants had to pay the land revenue due to the British government in time. Moreover, they had to grow commercial crop on a specified track of their land under the oppression of planters. The peasants also went in for growing commercial crops to pay back the interests to money lenders in time.

Commercialisation of Indian agriculture started post 1813 when the industrial revolution in England gained pace. Commercialisation of agriculture had many results. It was beneficial to the British planters, traders and manufacturers, who were provided with opportunity to make huge profits by getting the commercialised agricultural products at, throw away prices. Commercialisation of Indian agriculture also partly benefited Indian traders and money lenders who made huge profits by working as middlemen for the British.

In this regard they acted as conduits delivering the products from peasants to the British company from where it was taken abroad. Moreover, Indian money lenders advanced cash advances to the farmers to cultivate the commercial crops and if the peasants failed to pay him back in time, the land of peasants came under ownership of moneylenders.

However, most of the Indian people suffered miserably due to the British policy of commercialisation of Indian agriculture. It resulted in reduced area under cultivation of food crops. The net result of this change was that India failed to produce even that much food crops which could provide even two square meals a day to its population.

The misery was further enhanced because the population of India was increasing every year, fragmentation of land was taking place because of the increasing pressure on land and modern techniques of agricultural production were not introduced in India.

It affected adversely the poor people of India; it became difficult for them to get even sufficient food. This becomes ample from the fact that till 1880 India had a surplus of foodstuffs to the extent of five million tonnes and by 1945 it had a deficit of 10 million tonnes.

The consumption of food was then estimated at one and a half lb per individual and in 1945 it was 1 lb. Nearly thirty percent of the Indian population was estimated to be suffering from chronic malnutrition and under nutrition. Thus, commercialisation of agriculture in India by the British was also one of the important causes of the impoverishment of the Indian people.

The poor peasant was forced to sell his produce just after harvest at whatever prices he could get as he had to meet in time the demands of the government, the landlord, the money lender and his family members' requirements. This placed him at the mercy of the grain merchant, who was in a position to dictate terms and who purchased his produce at much less than the market price. Thus, a large share of the benefit of the growing trade in agricultural products was reaped by the merchant, who was very often also the village money lender.

The net result of commercialisation of Indian agriculture was that most of Indian farmers failed to produce even that much food crops which could provide them even two square meals a day. Most importantly the life of the Indian peasant was tied to the highly fluctuating national and international market.

He was no longer a deciding factor in agricultural practices. Further, by making agricultural land a tradable commodity, the peasant lost his secure feeling. High land revenue demand forced him to take loan from the money lender at high interest rates. Failure to pay debt in time meant loss of land to the money lender at high interest rates. It led to land alienation and increase in the number of agricultural labourers whose conditions especially in plantation industry was pathetic.

The commercialisation of agriculture was a new phenomenon in Indian agricultural scene introduced by the British. While the upper class and British industries benefited from it, the Indian peasants' life was tied to remote international market. The worst effect of commercialisation was the oppression of Indian peasants at hands of European. This found expression in the famous Indigo revolt in 1859. Moreover, commercialisation of Indian agriculture got manifested in series of famines which took a heavy toll of life.

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