# FINANCING AGRICULTURE

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## Role of Greenhouse Technology in Precision Farming: An Indian Perspective

## Agrarian Crisis: Distress & Suicide

## Real Time Gross Settlement Need for Customers

## Marketing Analysis of Milk Production in Shirpur Tehsil of Dhule District of Maharashtra

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# EDITORIAL

### Global warming or global cooling?

The climate summit which was held in Copenhagen, Denmark from Dec 7-18, 2009 was watched with great expectations as 192 countries participated to tackle the problem of climate change. The Copenhagen Accord sets the goal of limiting global temperature increases to 2 degree celsius though it does not set any binding targets for emission reduction. Both developing and developed countries will have to inform UNFCCC of its commitment to reduce emission of greenhouse gases to mitigate the effects of climate change. The rich countries have pledged to contribute US$30 billion between 2010 and 2012 and $100 billion by 2020 for developing countries, particularly vulnerable countries and small island states, to help adapt to and mitigate the effects of climate change.

There is another viewpoint as promoted by Shri Janardhan Negi, an Indian geophysicist that the global warming phase will change to global cooling and the temperature anomaly will decline substantially by the year 2030. Some effects of the process are already evident in the cold wave of 2010 which has brought about widespread snowfall in almost the entire northern hemisphere. According to Shri Janardhan Negi, there is a strong global cyclic weather phenomenon which is independent of the greenhouse gas emissions.

In July 2008, some leading climatologists and meteorologists met in New York at the Energy Business Watch Climate and Hurricane Forum. The forum strongly suggested that a period of global cooling is emerging, but what restrained them from spelling it out categorically was a possible concern of a political backlash.

This theory is also backed by Intergovernmental Panel on Climate Change (IPCC) scientist Mojib Latif, who in an article in Daily Mail in January this year wrote "we're in for 30 years of cooler temperatures" which he calls it a "mini ice age". His theory is based on an analysis of natural oscillations in water temperatures in the oceans. However, he believes the current cold weather pattern as a pause, a "30-years-long blip", in the larger cycle of global warming, which postulates that temperatures will rise rapidly over the coming years.

Whatever be the direction of climate change in the short-run as well as long run, what is of utmost importance is for agricultural scientists to take stock of the situation and maintain sustainability of agriculture so that the food security of the human populace as well other living creatures is not jeopardised.

**A.K. Garg**
Editor-in-Chief

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Dhanraj Mahal, Chhatrapati
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Tel: 91-022-22028924
Fax: 91-022-22028966
Email: afcl@vsnl.com
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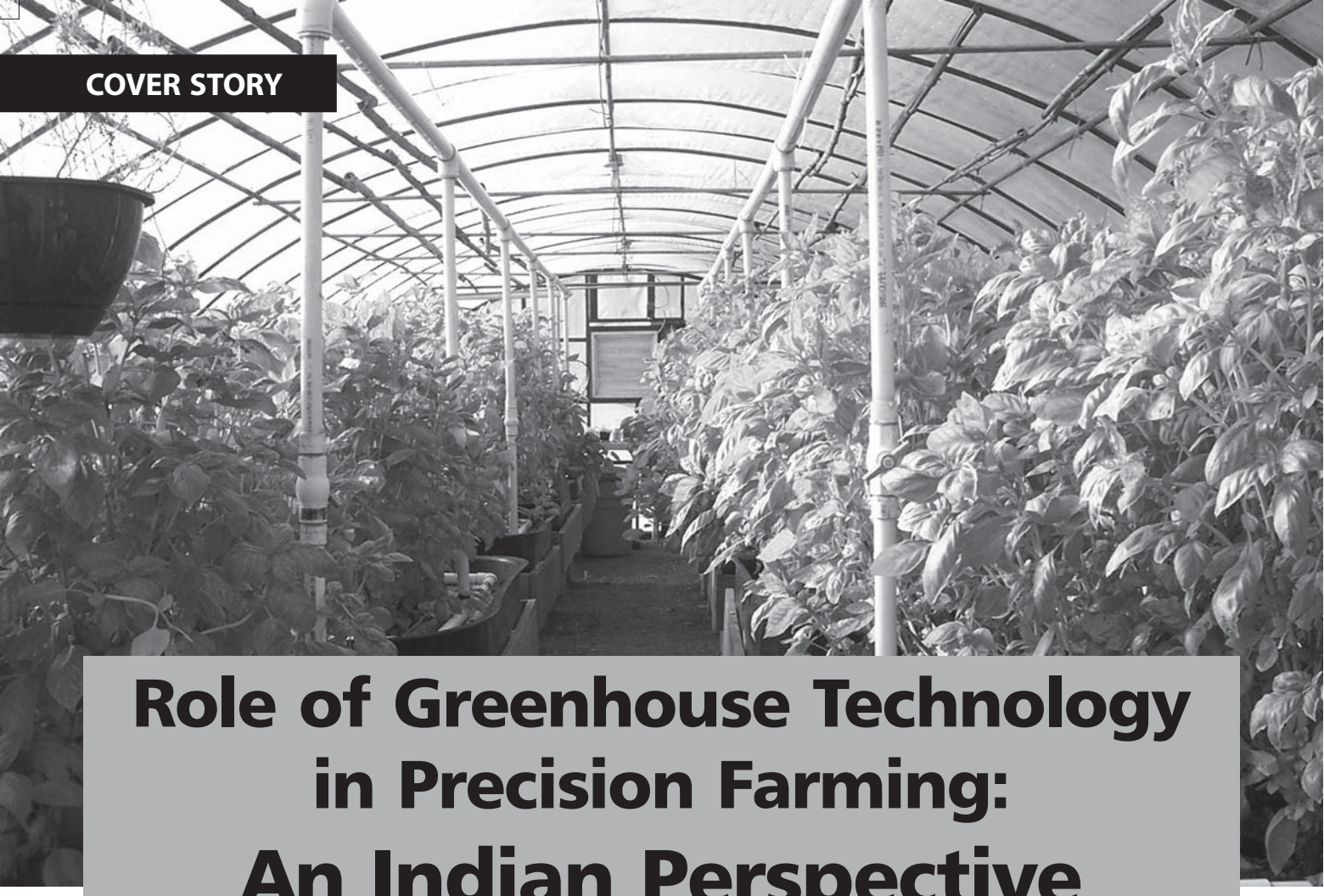


# Role of Greenhouse Technology in Precision Farming: An Indian Perspective

By K.S. Kumar and K.N. Tiwari*

## Introduction

India has witnessed an increase in food grain production from 51 million tonnes (50's) to 206 million tonnes at the turn of the century and that has helped in achieving self sufficiency. However, quick shrinking of the agricultural land threatens sustainable production of food grains and its ability to feed ever growing mouths. In this context, careful tailoring of soil and crop management practices suitable to local needs is of great importance to keep up the pace of production. Precision Farming otherwise called prescription farming or site-specific farming helps to overcome these constraints by accurately assessing the variability of crop production practices in space-time continuum by utilizing tools like Global Positioning System (GPS), Geographical Information System (GIS), Remote Sensing (RS) and Sensors.

Since ancient time, mankind has been aware of the fact that a wise modification of the environment could improve the productivity of crops. For instance, the fact that light transmitting shelters could create a suitable environment was certainly known to the Romans, as Emperor Tiberius used to eat a cucumber daily. Infact, the concept of Controlled Environment Agriculture (CEA) was not a novel idea and has been in use since a long time. Greenhouse Technology has been considered as the core part of precision farming and has a tremendous role to play in Indian horticulture by increasing the availability of fresh vegetables, fruits and flowers and thereby leading to better nutrition and improved standard of living.

A greenhouse can be defined as a "framed or an inflated structure with a transparent or translucent material in which crops could be grown under at least partially controlled environment and which is large enough to permit persons to work within it to carry out cultural operations". The greenhouse is now better understood as a system of controlled environment agriculture (CEA), with precise control of air, temperature, water, humidity, plant nutrition, carbon dioxide and light. The inside environment (microclimate) of the greenhouse is controlled by growth factors like light, temperature, humidity and carbon dioxide concentration. They are scientifically controlled to an optimum level throughout the cultivation period, thus increasing the productivity by several folds.

## Greenhouse Production

The liberalized seed policy in the late eighties, globalization of Indian economy and the economic reforms initiated in the early nineties paved the way for the advent of state of the art protected cultivation technology in India. The use of greenhouses for commercial agricultural production in India had

to wait until the technology became advanced enough in late nineties for the products to be sold at competitive prices. After the advent of plastics application in agriculture, greenhouse technology evolved as a breakthrough in the agricultural production technology. It has integrated market driven quality parameters with production system profits. Today, the expertise is such that in principle, it is possible to let the climate control computer to produce the microclimate desired by the grower according to the need of a particular crop with the benefit-cost ratio being more than one.

Despite its late entry, Indian greenhouse industry made rapid strides and nearly 300 to 500 ha of area has been brought under protected cultivation of horticultural crops. Abundant sunshine throughout the year especially in the autumn and winter season is perhaps the first blessing for year round production and that too without depending on artificial light and the related cost escalation due to additional energy input. However, necessary steps to reduce the high summer temperatures in the greenhouse by adopting suitable cost-effective cooling methods are necessary to boost up the year round greenhouse production in India.

*Fig: 1. Greenhouse designs suitable for subtropical India*

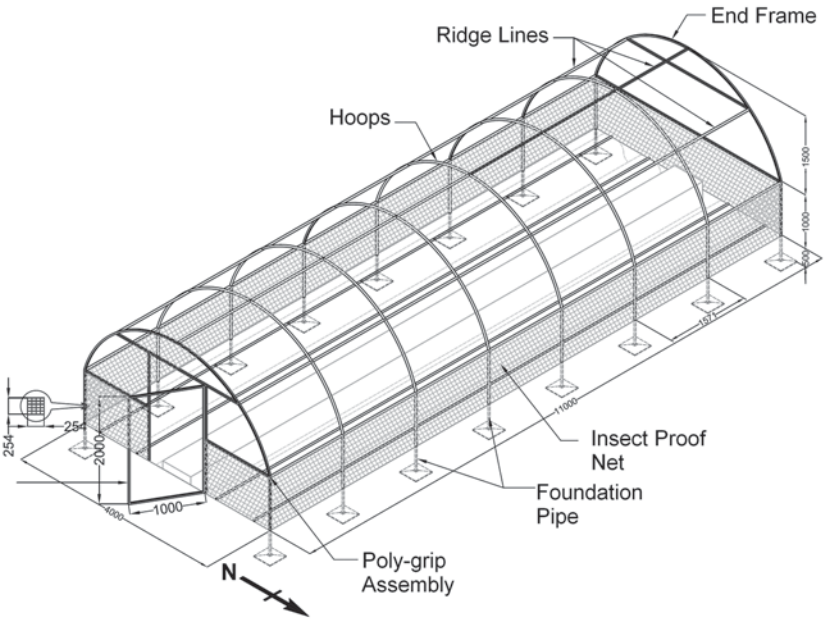



**Table1: Area under Greenhouse in Different Countries**

| Sl.No | Country | Area (ha) |
|---|---|---|
| 1 | Algeria | 500 |
| 2 | Australia | 600 |
| 3 | Belgium | 2400 |
| 4 | Bulgaria | 1350 |
| 5 | Canada | 400 |
| 6 | Chile | 1600 |
| 7 | China | 48000 |
| 8 | Columbia | 2600 |
| 9 | Egypt | 1000 |
| 10 | England | 3500 |
| 11 | France | 5800 |
| 12 | Greece | 4240 |
| 13 | Hungary | 5500 |
| 14 | India | 500 |
| 15 | Israel | 2200 |
| 16 | Italy | 18500 |
| 17 | Japan | 42000 |
| 18 | Jordan | 450 |
| 19 | Moracco | 3000 |
| 20 | Netherlands | 9600 |
| 21 | Poland | 1500 |
| 22 | Portugal | 2500 |
| 23 | Romania | 3500 |
| 24 | Spain | 25000 |
| 25 | South Korea | 21000 |
| 26 | Turkey | 9800 |
| 27 | USA | 4250 |

*Source: Jensen and Malter.1998. Protected Agriculture - A global review World Bank Technical Paper No.253.*

## Design of Greenhouses

India has varied climatic conditions in different regions, so the greenhouse and the supporting facilities have to be developed accordingly. Design of the greenhouse should vary as per the local agro-climatic conditions keeping in view the economic constraint. The southern plateau and the coastal regions need naturally ventilated polyhouses and northern plains with composite climate require both cooling and heating facilities. The initial cost of the greenhouse generally depends upon the cost of the structure, cladding and temperature control mechanism and where as the operational cost relies upon mainly upon the maintenance of temperature and humidity in the greenhouse.

## Low Cost Greenhouses for Nursery and Off-Season Cultivation of Vegetables

Large scale expansion of nursery and off-season cultivation of vegetables under cost-effective greenhouse structures is necessary to produce healthy seedlings and for consumption of fresh vegetables at lesser cost. Greenhouse design, structure and technology for producing high quality planting material need to be

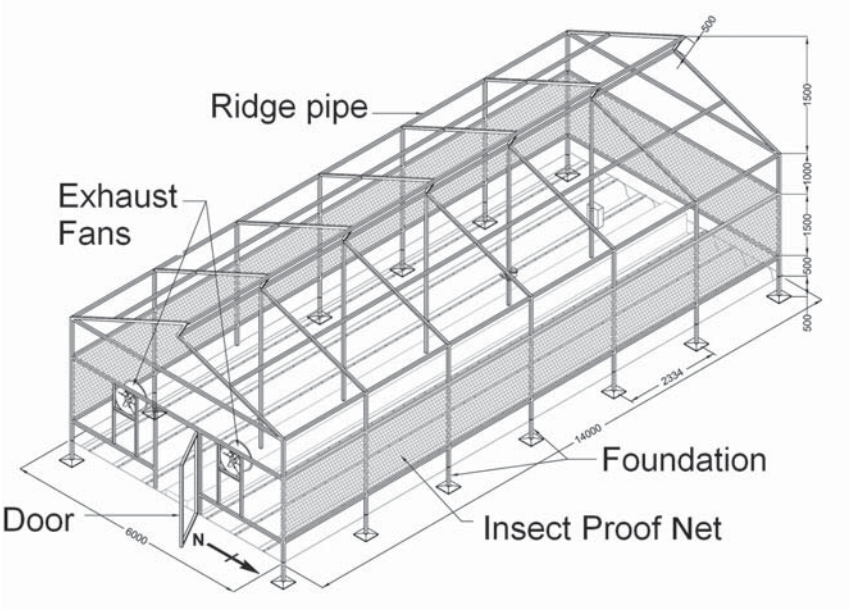



*Fig: 2. Greenhouse Production of Gerbera in Greenhouse at PFDC, IIT Kharagpur*

fine tuned to suit local climatic conditions. Efforts are also needed to develop suitable technology for production of healthy and well developed seedlings in plastic perforated trays. New growing media like soil less culture need to be standardized for optimum plant growth.

### Greenhouse Floriculture Production

In view of the growing international demand for floriculture products, especially cut flowers which have been registering an annual growth of over 11 percent (Anonymous, 1997), floriculture was given a priority status for export oriented market development in India. Cut roses accounted for 19 percent of the international cut flower trade and therefore, special attention is required in developing cut rose production as the major crop for export in India. However, in order to meet international standards for cut flowers, special greenhouse structures equipped with automatic environmental gadgets are required. However, the promotion of "hi-tech floriculture" as a specialized industry in India requires hand to hand support from both greenhouse growers and the government. The state-of-the-art technology imported from abroad for greenhouse floriculture needs substantial amendment with respect to the design of greenhouse to achieve cost effective production and be competitive in the global market.

**Table 2: Comparison of yield in open field, greenhouse and hydroponic system**

| | | Yield (tonnes/hec) | |
|---|---|---|---|
| Crop | Greenhouse | Open field | Hydroponic |
| Tomato | 150 | 50 | 187.5 |
| Cucumber | 180 | 8 | 250 |
| Capsicum | 110 | 100 | - |
| Broccolli | 15 | 7 | - |

*(Source: Chandra* et *al., (2003)*

### Greenhouse Cultivation in Precision Farming Development Centre, IIT Kharagpur

The precision farming development centre of IIT, Kharagpur has been actively involved in conducting field research, training and dissemination of developed technologies on greenhouse cultivation of crops for the benefit of farmers and state government officials. A brief description of concluded research activities includes design and development of low-cost plastic greenhouses for seedlings and offseason cultivation of vegetables and their yield responses. Estimation of water requirement for different vegetable crops has been documented. Apart from these, the centre has initiated an in depth study on the design aspects of greenhouse floriculture suitable for eastern climatic conditions of India. Studies on the variation of microclimate in the greenhouse coupled with deriving benefits of cost effective cooling methods to reduce high summer temperatures for floricultural production have also been undertaken.

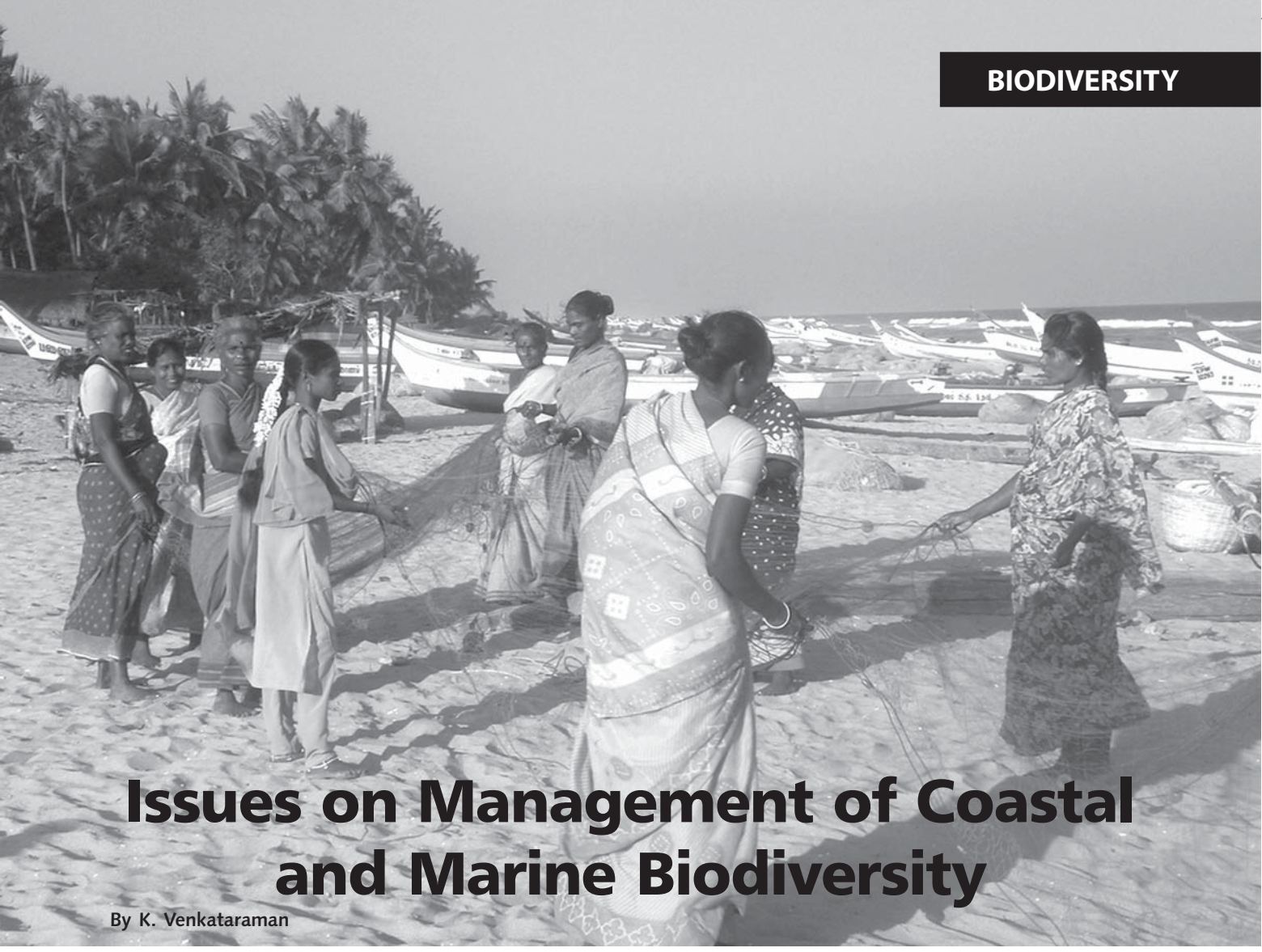
### Conclusions

Greenhouse Technology has got a tremendous role in keeping up the pace of precision farming in Indian Agriculture. Protected cultivation of vegetables and flowers not only increases the sustainability of agricultural production but also improves the standard of living. Necessary steps to maintain the glory of the greenhouse Industry include:

1. Improving the domestic markets facilities to offer high prices for the products of greenhouse
2. Exploring high value product alternatives such as propagating materials of export oriented crops.
3. Developing vertical integration and joint ventures that could be adopted by Indian growers.
4. Establishing a network of support systems from the government, universities and the private sector will be of immense value for growers and the industry.

** K.S. Kumar and K.N. Tiwari*

*Agricultural and Food Engineering Department, IIT Kharagpur*



# Issues on Management of Coastal and Marine Biodiversity

By K. Venkataraman

## Introduction

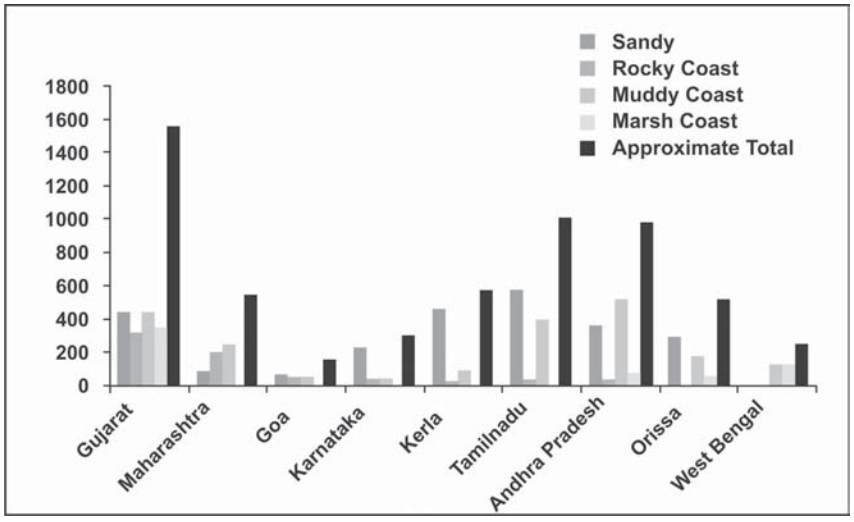
Coastal zone represents 18 percent of the earth's surface, providing space for 60 percent of the human population, since about 70 percent of the world cities with population more than 1.6 million are located in the coastal zone. 90 percent of the world fish catch is obtained from this zone. Interestingly, the hydrosphere of the coastal zone is only about 8 percent but represents about 18 to 33 percent of total primary production. This zone is biogeochemically more important as it buries and mineralises 80-90 percent of organic matter and the approximate carbonate deposition is estimated to be 50 percent. This area also receives discharges of suspended matter associated with elevated levels of pollutants from major rivers and this accounts for 75 to 90 percent. This zone has high biological potential as it serves as feeding, nursery and spawning grounds with rich biodiversity and as an intermediary biotope between marine and freshwater environments.

Coastal and marine ecosystems play a vital role in India's economy by virtue of their resources, productive habitats and rich biodiversity. India has a coastline of about 8000 km of which the mainland accounts for 5,422 km, Lakshadweep coast extends up to 132 km and Andaman and Nicobar Islands have coastline of 1,962 km. Nearly 250+ million people live within a distance of 50 km from the coast. The coastal area in particular, has been assuming greater importance in recent years, owing to increasing human population, urbanisation and accelerated developmental activities. The coastal regions are thus a place of hectic human activity and the coastal ecosystems are now highly disturbed and very much threatened. Current approaches to the management of coastal resources are not

**The Physical regime of the Indian coasts is characterised by different types of coastal and shore ecosystems like promontories (near Beypore in Kerala State), sand spits (at Karnataka and Andhra Pradesh), barrier beaches (along Kerala coast), embayment (Mirya Bay in Maharashtra), estuaries and offshore islands**

adequate for sustainable development and the coastal environments and resources are being rapidly degraded and eroded in India (Whittingham *et al.,* 2003).

The Indian mainland coast is divided into two parts: West Coast and East Coast. The West Coast is fronted by the Arabian Sea and the East Coast is by the Bay of Bengal. Other than these mainland coasts, there are three island groups such as Lakshadweep in the south Arabian Sea, Andaman and Nicobar in the eastern Bay of Bengal. The east and west coasts are markedly different in their geo-morphology. The West Coast is generally exposed with heavy surf and rocky shores and headlands. The East Coast is generally shelving with beaches, lagoons, deltas and marshes. It is also relatively low lying with extensive alluvial plains and deltas. The Physical regime of the Indian coasts is characterised by different types of coastal and shore ecosystems like promontories (near Beypore in Kerala State), sand spits (at Karnataka and Andhra Pradesh), barrier beaches (along Kerala coast), embayment (Mirya Bay in Maharashtra), estuaries and offshore islands.




*The description of the areas of coastline in different coastal states in India.*

**The increased population pressure has led to resource depletion and environmental degradation due to coastal pollution, disposal of domestic wastes and industrial wastes**

Further, the coastal zone of India is also endowed with a very wide range of ecosystems such as estuaries, lagoons, mangroves, backwaters, salt marshes, rocky coasts, sandy stretches and coral reefs which are characterised by unique biotic and abiotic properties and processes (Venkataraman and Wafar, 2005). Not realising the importance of the coastal and marine ecosystems and its multiple uses, the coastal population exploit the biological resources and interferes and modifies the basic coastal processes (Mehta, 1999). Traditionally, coastal areas of India are highly populated and developed because they are the places where trade, transport, communication and civilisation are well developed. It is estimated that, out of the 25 global mega cities, 15 would be on the coast. In India, out of the three mega cities with population more than 10 million, Delhi (13.2 million), Mumbai (16 million) and Kolkata 16.5 million, two are coastal cities *i.e.* Mumbai and Kolkata. The population density is also much more in coastal areas than the national average. For example, in the state of Tamil Nadu, the population density in coastal areas is 528 per sq km against 372 per sq km which is state average. In parts of coastal metros like Mumbai, Kolkata and Chennai the population density ranges from 20,000 to 50,000 per sq km. The increased population pressure has led to resource depletion and environmental degradation due to coastal pollution, disposal of domestic wastes and industrial wastes. As in most of the developing nations, the coastal environmental problems and issues in India are also concerned with the following three main conditions: environmental degradation, resources reduction and user conflicts.

The coastal situation in India mirrors global trends where unsustainable use of natural resources, pollution and habitat destruction are resulting in significant, if not fully irreversible, loss of the marine and coastal life support systems. Over fishing and the use of destructive fishing practices and habitat conversion have resulted in alarming degradation of coastal areas.

### Coastal regions in India are experiencing:

- Population growth in the coastal areas is mainly due to migration of job less villagers who were once working in agricultural fields.
- Widespread poverty in coastal areas fishers in particular among the poorest of the poor;
- Declining fisheries productivity in India is due to over harvesting and loss of habitats. Increasing population and poverty have put additional pressure on resources.
- Fish production has increased over a decade but per capita consumption of fish has declined.
- Increasing environmental damages due to human induced activities.

**Pollution from land-based activities, Industrial and Urban Development:** India stands at the threshold of this new

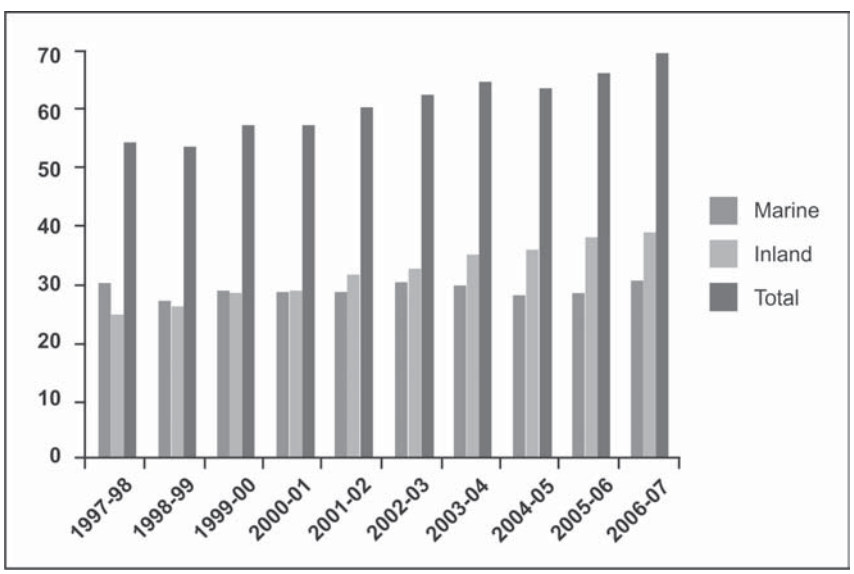
millennium probably with a bleak picture of the status of coastal resources and much to do to reverse the current trend. Without the sincere efforts of managers and scientists this cannot be achieved. In order to sustain and eventually improve the benefits we derive from coastal resources, momentous commitments and investments must be made by local coastal communities. Government of India, State Governments, and Non Government Organizations should put in additional effort in conservation and sustainable use of coastal resources. Furthermore, these efforts and initiatives must be coordinated and harmonized to achieve the goal of carrying these benefits to future generations. Coastal and marine management provides the tools for slowing and hopefully reversing the negative impacts of uncontrolled use of these resources. Coastal and marine management also provides the essential processes for integration of all sectoral, spatial, temporal, policy and institutional components crucial to achieve the goal of sustainable development.

**Resource use Conflicts:** Natural resources are those products readily bestowed to us by nature from which humans derive value. Forests, fisheries, minerals, water, and land resources are valuable commodities in India. Resource use conflicts arise when the benefits derived by one group of people using one resource have an impact on the benefits derived by another group using the same or another resource (Devaraj and Vivekanandan, 1999). Similarly, overuse of one resource may affect the relative health or abundance of another resource within an environmental system. Such impacts are not always obvious and must be understood.

Examples of resource conflicts that can be addressed by coastal and marine management include:

- Siltation from deforestation by resource users in upland areas negatively impacts coastal habitats and fisheries in coastal areas;
- Intrusion of commercial fishing in continental shelf regions results in overexploitation of limited fisheries resources where relatively few individuals benefit; and
- A probable lack of specific regulations (local and national) for fishing activities within known productive fishing grounds where small-scale fishers are directly dependent for livelihood.

Coastal areas all over India are developing rapidly because, people like to live near the sea. The consequence is that beaches, coastal land areas, and near shore coastal habitats are in great demand and are being utilized for a wide variety of conflicting human uses including industry, construction, dumping, boat landings, tourism, and habitation. Many user conflicts between traditional and mechanized fishers still persist within the 10 and 15 km limits.




*Fish Production in India (lakh tones)*

**Coastal areas all over India are developing rapidly because, people like to live near the sea. The consequence is that beaches, coastal land areas, and near shore coastal habitats are in great demand and are being utilized for a wide variety of conflicting human uses including industry, construction, dumping, boat landings, tourism, and habitation**

While commercial fishing is strictly prohibited within coastal waters by national laws, intrusion of large, highly efficient, mechanized fishing boats is prevalent. One result of the conflict between the mechanized and traditional sectors is decreasing catches. As indicated, catch from the traditional sector is being overtaken by catch from the mechanized and aquaculture sectors; meanwhile, traditional fishers are growing in number. The willingness of fishers to continue fishing when catches are declining indicates the relative lack of alternatives and the small value fishers enforcing time. If properly implemented, reserving the use of traditional fishing grounds by state and central law serves as a strategy for restricting access, reducing fishing pressure, and improving the condition of traditional fisheries for more fishers for a longer time. Local management regimes that clarify and limit user rights will improve sustainability of fisheries. An increasingly common situation is some of the recent developmental projects. These projects are encroaching large areas of coastal habitats, such as seagrass beds, coral reef and mangrove forests, thus permanently eliminating nursery grounds for fisheries without mitigation measures.

**Population growth and Poverty:** Population growth in coastal areas intensifies resource use conflicts in many

ways. The coastal areas are under increasing pressure from rapid population growth and the consequent concentration of development activities in the coastal strip (Whittingham *et al.,* 2003). More than 25 percent of Indian population lives in coastal areas because all major cities such as Mumbai, Chennai and Kolkata are situated in the coastal region and most large industries are located close to the sea. In addition, the most productive natural ecosystems in the country situated along the coast and support many people. As the population density increases the quality of life and the environment declines for the average person living in a coastal area.

**Illegal Activities:** The destruction of coastal habitats and decline of fisheries are to a large extent due to the proliferation of illegal activities. While national policies and laws exist prohibiting a wide range of activities in coastal and marine areas, without swift and enforcement of these laws, illegal activities still continue. Examples of illegal and damaging activities that can be addressed by coastal management include:

- Use of destructive and illegal fishing methods such as blast fishing, poisons, super lights, and others such as intrusion of commercial fishing into traditional fishing grounds, lack of regulations resulting in damaging construction and developmental activities in the coastal zone;
- Conversion of mangrove and seagrass habitats to land or other uses resulting in decline of near shore catch;
- Harvesting of banned species including corals, whale sharks, manta rays, giant clams and other endangered marine species; and
- Habitat destruction from other sources.

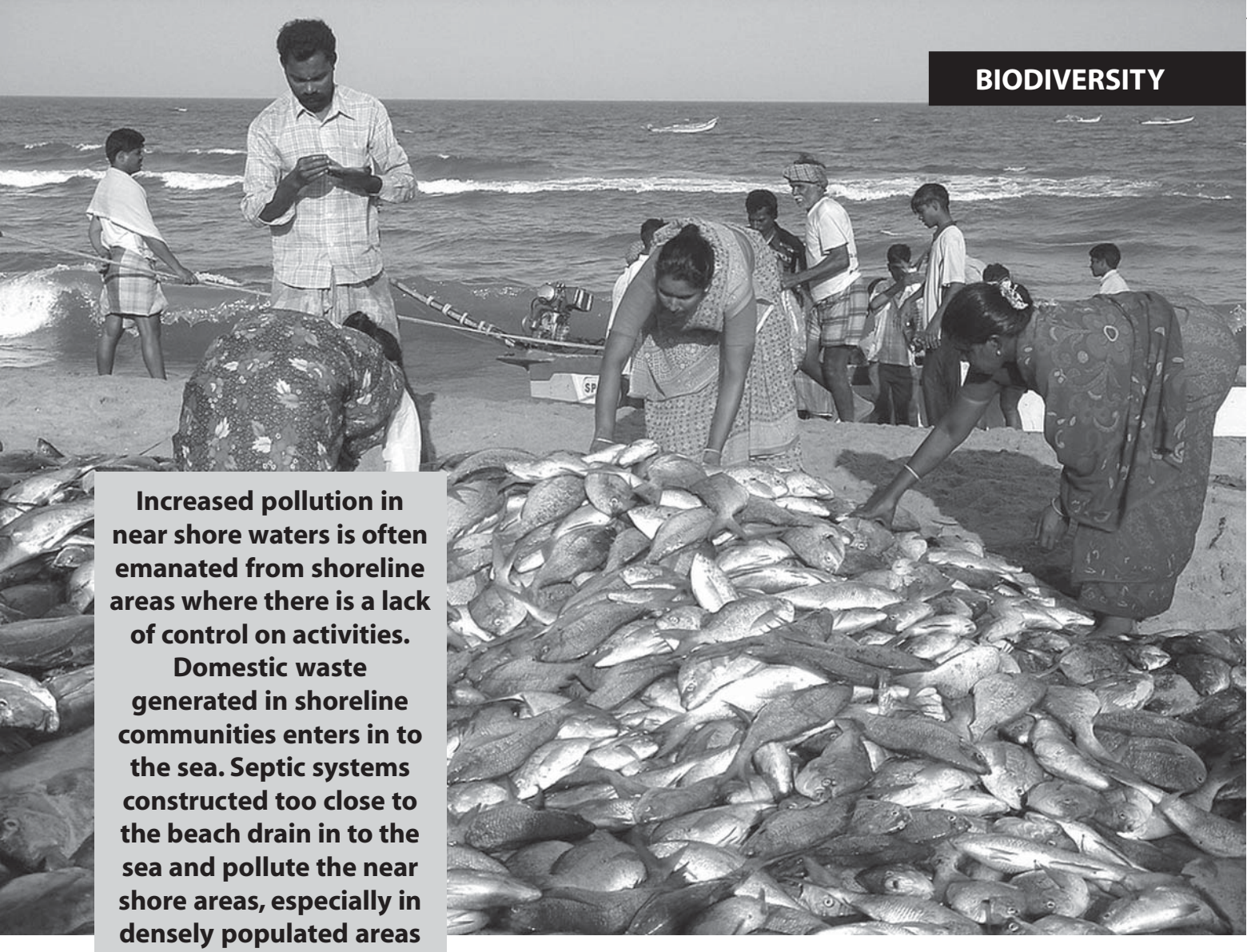
Enforcement of different acts promulgated by the parliament of India needs to be encouraged and become accepted as an important means to improve the status and productivity of coastal ecosystems. Fisheries will improve significantly if illegal fishing is stopped. Public education and better enforcement are two strategies that have proven to be effective.

Although it is a fact that the coastal areas from mean high tide to 500 m inland are protected by law and reserved as open access space where no building or private ownership is allowed (*Coastal Zone Regulation*), this law is not being enforced strictly by many states. Enforcing this law will prevent overcrowding and environmental degradation in coastal areas. Coastal land use and coastal areas all over India are being developed rapidly since people like to live and do business near the sea. The consequence is that beaches and coastal land areas are in demand and are being utilized for industry, construction, dumping, boat landings, recreation, habitation, and many other activities.

Illegal fishing methods, such as blast fishing that are known to destroy or shatter the physical structure of the coral reef, create considerable losses to society (Venkataraman and Wafar, 2005). The impacts of illegal and destructive fishing practices on the environment are long term and irreversible, with continuing reductions in net returns for all types of fishing methods.

**Aquaculture Development:** Aquaculture activity got a boost in the early 1990s in the coastal parts of India on account of economic liberalization policies initiated by the Government of India. The increased production was both a result of increased area under expansion and increased productivity. Coastal aquaculture in India is mainly related to shrimp farming. The contribution of cultured shrimps to the total shrimp export increased from 48.78 percent in 1988-89 to 75.07 percent in 1998-99. However, it suffered a setback with the Supreme Court declaring it contrary to the Coastal Regulation Zone notification and banning all aquaculture activities, except traditional and improved traditional within up to 500 m of the High Tide Line (HTL) in most coastal areas.

The primary concern in India related to aquaculture development is the conversion of coastal ecosystems, primarily mangrove, to fish, seaweed or shrimp ponds (Nanda Kumar *et al.,* 2001). This activity has replaced original mangrove forest in the country. Another significant impact results from various kinds of pollution generated by aquaculture because it is essentially a farming system that uses fertilizer, feeds, and chemicals. In concentrated form, they are detrimental to near shore water quality, natural fisheries, and human health. Considering the environmental damages of aquaculture



**Increased pollution in near shore waters is often emanated from shoreline areas where there is a lack of control on activities. Domestic waste generated in shoreline communities enters in to the sea. Septic systems constructed too close to the beach drain in to the sea and pollute the near shore areas, especially in densely populated areas and islands such as Lakshadweep and Andaman**

practices, the Supreme Court of India banned aquaculture within CRZ and entrusted the job of issuing clearance to the farms for the existing/proposed farms outside the CRZ to the Aquaculture Authority constituted as per the directions of the Supreme Court of India with headquarters at Chennai. To assist the Authority in regularizing shrimp farming, State level committee and District level committees have been constituted in the State.

**Inadequately regulated coastal development has resulted in several issues:** Adequate measures are essential to create an open space for access, to minimize negative impacts on the near shore marine systems such as reefs and seagrass beds, to minimize erosion caused by structures on the beach, to effectively control dumping into the sea, and to create a visually attractive area, uncluttered with haphazard development. Increased pollution in near shore waters is often emanated from shoreline areas where there is a lack of control on activities. Domestic waste generated in shoreline communities enters in to the sea. Septic systems constructed too close to the beach drain in to the sea and pollute the near shore areas, especially in densely populated areas and islands such as Lakshadweep and Andaman. Dumping of solid waste in near shore areas is a related problem. Construction activities near the beach and sea often cause silt to wash into marine waters and smother reefs and seagrasses or affect near shore fisheries.

Erosion of beach sand, usually results from the construction of structures on or near the beach. Although sandy beaches normally replenish themselves after a storm, once a beach wall or perpendicular jetty is in place, the natural movement and return of the sand is prevented. Thus there is a need to prevent all construction in the coastal areas. Examples of this problem can easily be seen along developed shorelines such as on Lakshadweep Island or in some islands of Andaman, where natural beaches have disappeared; squatting should also be prevented in the coastal areas. Such settlements are difficult to get rid of. They have the excuse that they are poor, landless people with few alternatives. Unfortunately, the continued prevalence of squatting only encourages more people to do the same, mostly detrimental to coastal and beach areas and any hope of environmental integrity.

(To be continued……)

# Marketing Analysis of Milk Production in Shirpur Tehsil of Dhule District of Maharashtra (India)

By Vijay Gorakh Patil*

*The random sample survey study on fifty dairy farmers from eight villages of Shirpur Tehsil of Dhule District of Maharashtra (India) was undertaken to know the cost of production of milk in the study area. The total cost of milk production per cow/buffalo was Rs. 113.87 in which the variable cost was 83.76 percent (Rs. 95.38) and remaining Rs. 16.24 percent (Rs. 18.49) was fixed cost. In variable cost, the cost of feed stuff was 73.39 percent (Rs. 70). Labour cost was 15.73 percent (Rs. 15.00), the cost of medical treatment was 2.62 percent (Rs. 2.50) and interest on working capital was 8.26 percent (7.88). Finally it was found that the cost of milk was Rs. 9.10 per liter in the study area.*

## Introduction

Dairy farming has been recognized as an important source of income and is more remunerative in comparison to crop production in India. Milk production in India is predominantly the domain of small farmers in mixed farming system. Scientific dairy management helps the farmer to channelize his limited resources to maximize returns from his dairy farm.

The importance of dairying lies not only in products but also it brings about significant changes in socio-economic structure of rural economy. The National Commission on Agriculture (1976) observed dairying as an additional enterprise for improving the status of rural masses especially weaker sections consisting of small, medium & landless laborers. It is therefore, becomes essential to examine the production cost of milk.

## Explanation of the problem

In this research the investigator had studied the production cost of milk at the farmer level in Shirpur Tehsil of Dhule District of Maharashtra state (India). The investigator had selected fifty dairy farmers from eight villages from Shirpur Tehsil, District Dhule. In the questionnaire, questions related to fixed and variable cost were asked. It was distributed to dairy farmers for collecting primary data. The collected data was analyzed by using the statistical tool percentage and conclusions were drawn.

## Objectives of Assignment

To estimate the cost of milk production.

## Hypothesis

The hypotheses were formulated for testing through empirical data on the objectives of the present study.

The cost of milk production would be estimated.

## Significance of the Study

Our country being the largest democratic one in the world, any person can have a profession of their own choice. The largest part of Indian population is engaged in agriculture as a main occupation. However, the main occupation of agriculture does not seem to meet the need of an individual, as the pressure on land holdings is mounting day-by-day due to population explosion. A subsidiary income source is necessary to contemplate with the situation, so that our farmers can achieve enough food security. Indian farmers have adopted animal husbandry as a subsidiary occupation. Dairying is recognized as the best alternative to provide employment to rural people in order to improve their living condition. Dairy enterprise provides ready cash in hand to rural households for fulfilling their daily requirements. Therefore, it was essential to bring the cost structure of milk production in front of dairy farmers enabling them to decide at what price the milk should be sold. The investigator also focused on the fact that the farmers should understand how the input cost would be reduced and the profit increased.

## Selection of Respondents

Primary data were collected from the randomly selected farmers from eight villages of Shirpur Tehsil. Thus a sample of 50 dairy farmers was drawn for the study.

## Preparation of Interview Schedule

A structural interview schedule, consisting of relevant questions related with the objectives of the study was prepared. Every precaution was taken to keep the language simple so as to get desired responses from the respondents. The interview schedule was developed in Marathi (Local Language) for better understanding for the dairy farmers. It contained questions related to the cost of milk production, cost of feed etc.

## Pre-testing of Interview schedule

The Interview schedule so developed was pre-tested for its accuracy, simplicity and practicability with a group of 10 dairy farmers in village Dahiwad. Considering the experience of pre - testing, related questions were put together to have consistency in response. The language of a few questions was modified for ease in understanding and eliciting accurate response. Sufficient number of copies of interview schedule were then prepared and used for collection of data.

## Collection of Data

The primary data were collected personally from the sample respondent by adopting personal interview method with the help of interview schedule developed for this purpose. The respondents were contacted at their time on farm as per their convenience. The rapport was established by explaining them the objective of study.

### Tabulation and Analysis of data

The data were analyzed on the basis of specific objectives of the study and hypothesis formulated for the study. The data in the primary table were used for the categorization of parameters according to the objective of the study, preparation of secondary table and the application of statistical tools.

The statistical tools used in the present research study were Arithmetic mean, percentage.

### Result and Discussion

Research methodology of this study is presented in the following subheads.

The cost of milk production included

a) Fixed cost as well as
b) variable cost.

Fixed cost, includes i) Depreciation on shed ii) Depreciation on Live Stock iii) Depreciation on miscellaneous items and iv) Interest on fixed capital. Variable cost includes. – i) Cost of feed stuff ii) Labour cost iii) Cost of treatment and iv) Interest on working capital. The cost of milk production was Rs. 9.10 per liter in the study area.

The total cost of milk production per farm was Rs. 113.87 in which the variable cost was 83.76 percent (Rs. 95.38) and remaining 16.24 percent (Rs. 18.49) was fixed cost. In variable cost, cost of feed stuff was 73.39 percent (Rs.70), Labour cost was 15.73 percent (Rs. 15.00), the cost of treatment was 2.62 percent (Rs. 2.50) and interest on working capital was 8.26 percent (Rs. 7.88). From the above discussion it was concluded that the cost of labour and cost of feed stuff was the main component in the production of milk in the study area. These findings are also in conformation to Prashant Khare (2003)

## Summary

1) **Cost of Milk production**- The Cost of milk production was 9.10 per liter in the study area. The total cost of milk production per farm was Rs. 113.87 in which the variable cost was 83.76 percent (Rs. 95.38) and remaining 16.24 percent (Rs.18.49) was fixed cost.

### Conclusion and suggestion

The variable cost was the main component of the cost of production. In variable cost, the cost of feed stuff and the cost of Labour are the main. Therefore effort should be made to ensure that farmers share some of their land in the cultivation of the fodder and proper management of labour should be the focus.

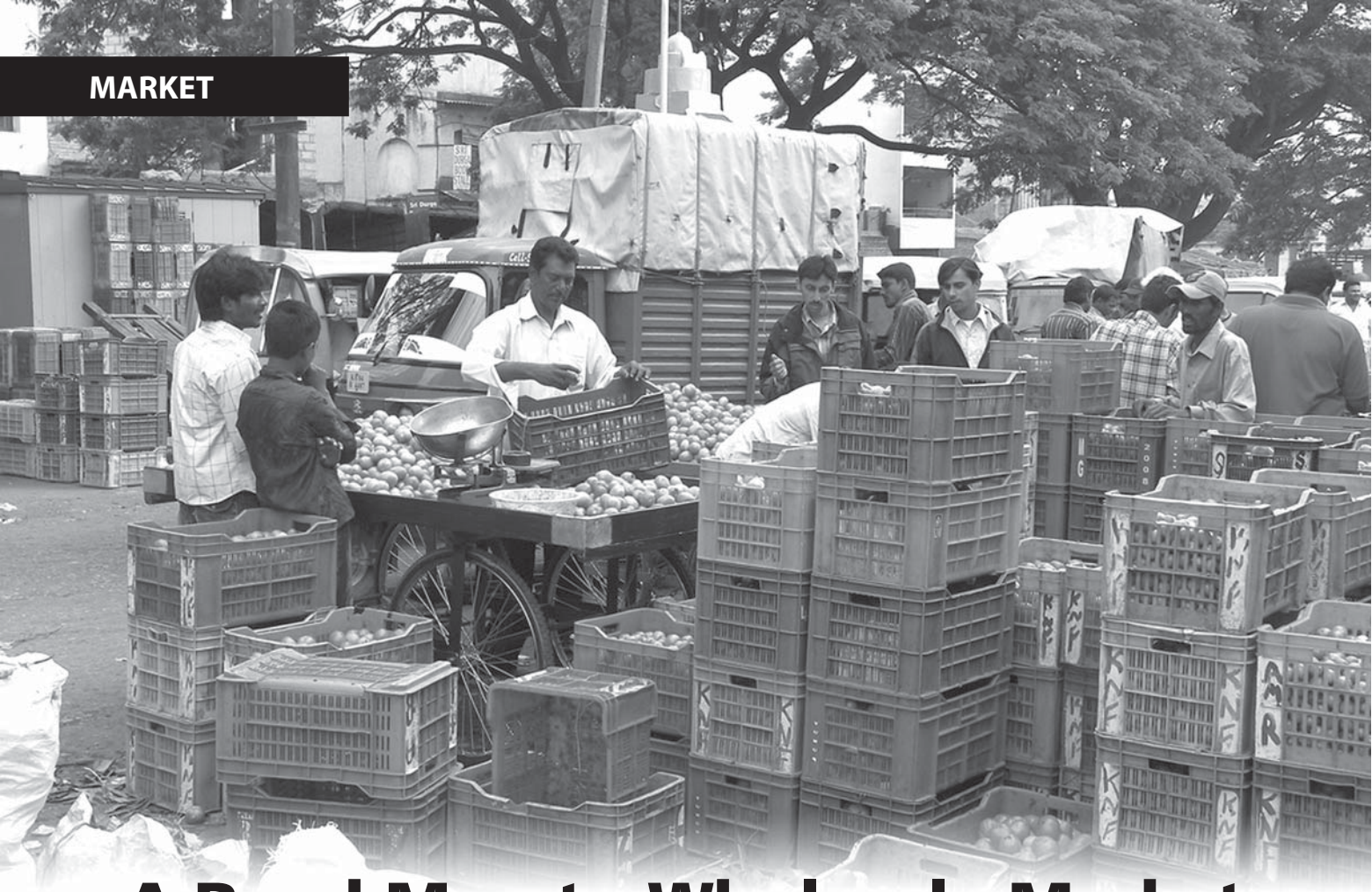
### Implications

1. The study analyzed the cost of milk production which will help the dairy farmers to minimize the variable cost and to increase the profit.
2. The investigation made it clear that low price is the major problem of the farmers. The investigation should help the farmers to produce better quality of milk which will be given high price.
3. The study would be helpful for employment generation
4. The findings of the study would be helpful in deciding "At what cost the milk should be sold?".
5. The findings of the study would be helpful in reducing the input cost.

**Vijay Gorakh Patil*-*Ph. D. Research Fellow YCMOU, Nashik*a

**Table 1: Cost of milk production**

| S.N. | Particulars | Milk Production Cost (Rs.) | Percentage to Total |
|---|---|---|---|
| 1 | Fixed Cost | | 16.24 |
| a) | Depreciation on cattle shed | 1.66 | 08.98 |
| b) | Depreciation on Livestock | 8.33 | 45.05 |
| c) | Depreciation on Misc. Expenses | 1.00 | 05.40 |
| d) | Interest on Fixed Cost | 7.50 | 40.57 |
| | Total Fixed Cost | 18.49 | 100.00 |
| 2 | Variable Cost | | 83.76 |
| a) | Cost of feed stuff | 70.00 | 73.39 |
| b) | Labour Cost | 15.00 | 15.73 |
| c) | Cost of treatment | 02.50 | 2.62 |
| d) | Interest on working capital | 07.88 | 8.26 |
| Total of Variable Cost | | 95.38 | 100.00 |
| Total Cost of Production | | 113.87 | - |
| | Value of dung | 10.00 | - |
| | Net Cost of Production | 103.87 | - |
| | Milk Production Per day ( Lit) | 12.5 | - |
| | Per Liter Cost of Production | 9.10 | - |



# A Road Map to Wholesale Market Infrastructure – PPP Mode

By Satyaveer Singh* and Subah Singh Yadav**

## Background

As per the Census (2001), about 228 million people in rural India (equivalent to 56 percent of the total labor force) are farmers and agricultural laborers. The National Sample Survey Organization (NSSO) in 2005 had estimated that while farming households accounted for 60 percent of households in rural areas, direct income from farming activities accounted for over 50 percent of farm household incomes. As agricultural growth appears to be decelerating, policy makers are concerned about its impact on the National economy. The average annual rate of growth of agricultural GDP declined from 3.4 percent during 1985/86 - 1994/95 to 1.8 percent in 1995/96 - 2002/03.

Need for a Holistic Development Approach and Significance of Agricultural Markets

In such a situation a vibrant agricultural sector is needed not only for raising the income levels of the people dependant on agriculture but also for accelerating the growth of other sectors of the economy as both are mutually reinforcing. At the current stage of India's development, while looking at the options for strengthening agricultural sector, there is a need to address agriculture in a holistic manner covering production, processing, marketing, distribution, utilization and trade of food, feed and other agricultural products. The agricultural development strategy must address not only farmers but all other stakeholders engaged in marketing, trade, processing and agri-business, i.e. total supply chain right from 'the Farm gate to the Food plate'. In this context, agricultural marketing system obviously assumes added importance.

Agricultural marketing system is the critical link between farm production sector on the one hand and non-farm sector, industry, and urban economy on the other. Apart from performing physical and facilitating functions of transferring the goods from producers to consumers, the marketing system also performs the function of discovering the prices at different stages of marketing and transmitting the price signals in the marketing chain. An efficient marketing system helps in optimization of resource use, output management, increase in farm incomes, widening of markets, growth of agro-based industry, addition to national income through value addition, and employment creation. The issues and concerns in marketing relate

mainly to the performance (efficiency) of the marketing system, which depends on the structure and conduct of the market and infrastructure available for performing marketing functions. These, in turn are influenced by the extent and form of government intervention.

### Classification of Agricultural Markets

Markets in India can be broadly grouped under three main categories – primary, secondary and terminal. Markets differ considerably from one another as regards the functions they perform, the facilities they offer and the services they render.

**Rural Primary Markets** include mainly the periodical markets known as haats, shandies or painths and fairs which are estimated to be more than 21,000 to a maximum of 47,000 in number. These are located in rural and interior areas and serve as focal points to a great majority of the farmers – mostly small and marginal for marketing their farm produce and for purchase of their consumption needs. These markets may also function as collection canters to adjoining secondary markets and are devoid of most of the marketing facilities and look like strips of land serving as meeting place between sellers and buyers. The commodities collected in these markets find their way to the wholesale assembling markets.

The number of primary rural markets in the country is more than 21,000. According to the report of Marketing and Research Team (MART), New Delhi on traditional Haats and Melas in India, a study sponsored by the Ministry of Rural Development during 1995, it is estimated that there are 47,000 Haats of which 75 percent are held once a week, 20 percent twice a week and 5 percent held daily. The study indicates that on an average, one haat caters to approximately 14 villages. The relationship between the distribution of villages according to population or range and the availability of haats, smallest village (population less than 500) held the fewest haats (only 1.6 percent). Majority of haats (47.9percent) are held in the largest villages (those with a population of over 5000 persons). The study reveals that nearly 2/3 of the haats are held at a distance of 16 kms are more, 23 percent are held at 6 to 15 kms distance and 9 percent within a distance of 1 to 5 kms. The amenities and facilities available in these haats are far from satisfactory.

**Specialized single commodity markets are not many except a few markets for cotton, jute, oilseeds, fruit and vegetables. The layout of most of the secondary markets is inconvenient and unsatisfactory. The business is conducted according to market practices established by age old customs, or as per the regulations of APM committees wherever regulated**

**Wholesale/assembling markets** or the **secondary markets** numbering 6359 constitute the cardinal link in the market structure in the country. Although better organized than the primary markets, these markets present divergent pictures with regard to facilities offered and services provided. Most of these are located in the district and taluk headquarters, important trade centres and nearby railway stations and perform assembling and distribution functions. In most of these markets, a number of commodities are traded. Specialized single commodity markets are not many except a few markets for cotton, jute, oilseeds, fruit and vegetables. The layout of most of the secondary markets is inconvenient and unsatisfactory. The business is conducted according to market practices established by age old customs, or as per the regulations of APM committees wherever regulated. These markets play an important role in determining the prices of agricultural produce assembled there and as such have a governing impact on terms of trade between agriculture vs. other sectors of economy. The users of these markets, either buyers or sellers have to pay fee to the managers of the market places. Facilities in the places vary extensively. Nearly 2/3 of market yards and sub yards were laid out initially on vast land area with such facilities as

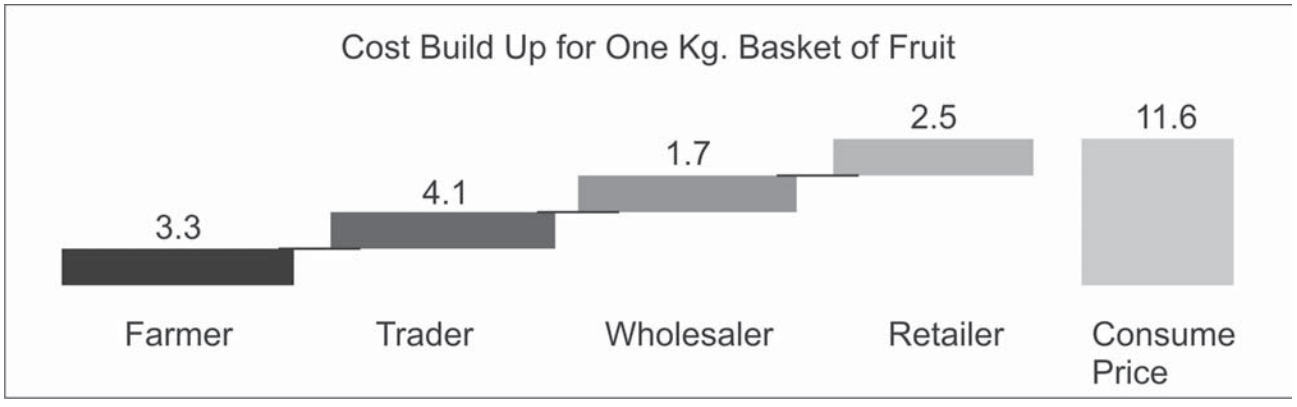
auction platforms, shops, godowns, rest houses and parking lots. However, studies have shown that facilities available in these yards are considerably short of the requirements and most of them have become congested.

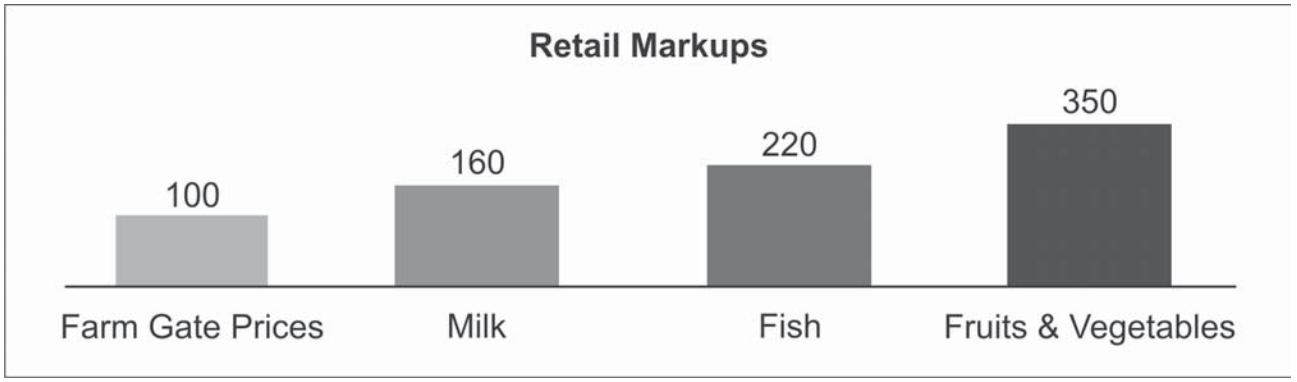
**Terminal Markets** which have become an important feature in developed countries, is expected to gain ground in India. The Safal complex of NDDB is one such format, located at Bangalore. Though they are expected to be located nearer to big cities and terminal points providing the final link in the market structure and sellers are usually the traders and not the growers in these markets unlike the primary and secondary markets, the terminal market concept promoted in India is expected to link the farmers to these markets directly through collection centres. Government of India had announced to set up terminal market complexes for perishables at Nagpur, Nashik, Bhopal, Kolkatta, Patna, Rai, Chandigarh and Mumbai during 2006-07. Govt of Karanataka had also advertised RFP for setting up 4 more terminal markets at Kolar, Hassan, Bangalore and Mysore during the year 2007-08. The terminal market complex is in a "hub and spoke" format, with terminal market as "hub and number of collection centres as "spoke" near to the production areas. The terminal markets provide for multiple options for farmers for disposal of produce. The Central Government is encouraging the set up of these markets on a Public Private Partnership Model to encourage private sector participation in operations and management of the markets by announcing an equity assistance scheme upto 49 percent through the National Horticulture Mission. Such Modern Terminal Markets with state of the infrastructure and facilities are expected to reduce post harvest losses and increase farmers' realization besides bringing about a shift from the largely supply driven model to a demand driven model.

**Present Scenario in Value Chain**

**The number of primary rural markets in the country is more than 21,000. According to the report of Marketing and Research Team (MART), New Delhi on traditional Haats and Melas in India, a study sponsored by the Ministry of Rural Development during 1995, it is estimated that there are 47,000 Haats of which 75 percent are held once a week, 20 percent twice a week and 5 percent held daily**

**Present Scenrio in Value Chain**




*Source : Presentation of Jt. Marketing, GOI, Ministry of Agriculture and Cooperation*

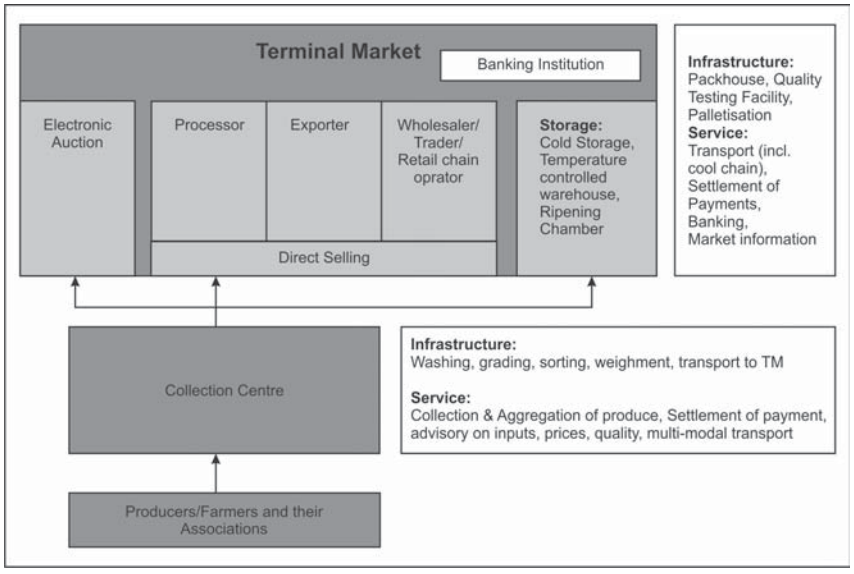
Cost-plus model at every stage in terms of share of farmers, trader wholesalers, retailer in consumer's rupee.

### Terminal Market Eligibility

Terminal Market Complex project is built, owned and operated by the selected Private Enterprise (PE) through Competitive Bidding process. PE includes individual or consortium, Group of Farmers/Growers/Consumers/Producer Organisations/Producer Company, Partnership/ Proprietary firms, Companies, Marketing Boards, Public Sector Undertaking, Co-operatives, registered NGOs empanelled with GOI/State Govt./ Planning Commission, recognized Self Help Groups under the schemes of GOI/State Govts. and other registered bodies engaged in production and trading of agricultural produce. The PE could also be a consortium of entrepreneurs from, *inter-alia*, agri-business, cold chain, logistics, warehousing, agri-infrastructure and related background.

**Private Enterprise includes individual or consortium, Group of Farmers/Growers/ Consumers/Producer Organisations/Producer Company, Partnership/ Proprietary firms, Companies, Marketing Boards, Public Sector Undertaking, Co-operatives, registered NGOs empanelled with GOI/State Govt./Planning Commission, recognized Self Help Groups under the schemes of GOI/State Govts. and other registered bodies engaged in production and trading of agricultural produce**

### Infrastructure at Terminal Markets




*Source: Guidelines of Terminal Market, Ministry of Agriculture and Cooperation, GoI*

### Expected Outcome from the Modern Terminal Markets

| Parameters | Present Status | Expected Outcome |
|---|---|---|
| Trade Transparency | Non Existing | Transparent Auction through Electronic Auction System |
| Cold Chain Infrastructure | Very Poor | Setting up of cold storage at each market ranging from 2000 to 15000 MT capacity |
| Backward-forward linkages | No Linkages | Minimum of 20 collection centers nearer to the farmers field will be set up. The farmer will have alternative options to supply to the supply chains, processing, export of commodities etc. |
| Monopoly of APMC Markets | Prevailing | Farmer is provided with alternative option of taking his produce to terminal markets |
| Multiple intermediaries | Prevailing | Length of the chain of commission agents will substantially be reduced with an ideal situation of eliminating the commission agents completely |
| Beneficiary farmers | - | 16000 to 20000 farmers under each terminal market |
| Share of the farmer in the consumer price | Varies from 30 to 60% for perishables depending on the location, season, demand and supply etc. | Farmer's share is expected to increase to 50 to 70% of the consumer price |

**Wholesale Facilities:**

- Cash and carry
- Transporters shops
- Exporters shops
- ATM Counters
- Price display boards
- Conference rooms
- Multipurpose halls
- Counseling centre
- Laboratories
- Research centre
- Electronic auctioning
- Packaging units
- Electronic grading and sorting lines
- Labeling of produce
- Pre-cooling unit
- Cold storage
- Ripening chambers
- Washing areas
- Quality testing facility
- Temperature controlled warehouses

**Non Marketing Services:**

- Freight consolidation
- Logistic centres
- Fertilizers and manure shops
- Nurseries/plant shops
- Storage area for plastic crates, trolley/ forklifts, wooden palates
- Information cell
- Fire fighting services
- Maintenance and repair shops
- Rain water harvesting
- Garbage composting
- Sewage treatment plant

**Expectation from the Private Player**

1. Establish collection centre in the catchment area of the terminal market.
2. Provide cleaning, washing and sorting (Grading) facilities at the collection centre
3. Provide transportation facilities from CC to TM or CC to Forward Markets and Processing Units
4. Provide Transparent Electronic uction System in TM and Electronic Display Boards at Collection Centre
5. Plastic crates for Fruits and Vegetable on reasonable rent
6. Agri-clinic facilities for good agriculture practices, input seeds, fertilizer and pesticides etc.
7. Support in crop insurance and farmers insurance
8. Provide a corpus fund for education of farmers' kids (1% less rate of interest than to commercial banks)
9. Grading and certification laboratory facilities at TM
10. Cold storage and cool chain management at TM
11. Ripening Chambers/VHT plant etc. as per the need of the commodity specific TM
12. Organic Solid Waste Management Plant for de-bio-gradation of waste in organic compost
13. Market Intelligence System at TM for demand and supply analysts and price discovery mechanism
14. World class hygienic environment in the TM
15. E-trading facilities at TM

| Risk Categories | Phase of Dominance | Allocation of Risk |
|---|---|---|
| Land Acquisition | Project Development | State Govt/Private party |
| Political and Social Risk | Throughout Project Cycle | State Govt/Private party |
| Delays in Project Development<br>-Design<br>- Planning Risk | Project Development | Private Party |
| Project Construction Risk | Construction Period | Private Party |
| Project Cost risk/Cost Over-Runs | Construction Period | Private Party |
| Technology Risk | Construction/Operations Period | Private Party |
| Regulatory & Administrative | Operation Period | State Govt/Private party |
| Commercial Risk<br>*Business Process and Policies | Operation Period | Private Party |
| Operation and Maintenance | Operation Period | Private party |
| Financial Risk<br>Interest Rate, Tax Rate, Inflation | Operation Period | Private Party |
| Termination Risk | Operation Period | Private Party |
| Environment Risk | Construction/Operation Period | State Govt/Private party |

***Policy Change could delay the project; people may not be so clear with new processes which will affect their ability to utilize the solution; Possibly new process will not be fully integrated initially; Possible void if new process don't fully cover all contingencies.***

**PPPs are often complex transactions, needing a clear specification of the services to be provided and understanding of the way risks are allocated between the Government and Private Sector. Most of the PPPs are in nature of long term project and therefore, Government has to develop and manage the relationship with the private providers to overcome unexpected events that can disrupt even the best design contracts**

**Expectation from the Government**

1. Single license to operate in the state
2. Autonomy in commercial operation of TM
3. Single point levy/Collection of Market fee

### Public Private Partnership Model (PPP)

Infrastructure shortages are proving a key constraint in sustaining and expanding country's economic growth and ensuring that all citizens are able to share its benefits. To meet this challenge, the Government is committed to raising investment through Public Private Partnership activities in all key infrastructure sectors including agricultural marketing. It is important that to understand the PPPs are not catch-all solutions to the persistent difficulties of under-investment and lack of resources for development. PPPs are often complex transactions, needing a clear specification of the services to be provided and understanding of the way risks are allocated between the Government and Private Sector. Most of the PPPs are in nature of long term project and therefore, Government has to develop and manage the relationship with the private providers to overcome unexpected events that can disrupt even the best design contracts. And ultimately, PPPs always involve projects for which, in the eyes of the citizens, government ultimately bears responsibility- even if the task of delivery has been contacted out.

### Project Risks and allocation of Risks

1. Regulatory
2. Political
3. Commercial
4. Financial Risk
5. Market Risk
6. Land Acquisition Risk
7. Construction Risk
8. Technology Risk
9. Cost Overrun Risk
10. Force Majeure Risk
11. Operation and Maintenance

### Risk Mitigation Steps

Identifying the events or actions which affect the viability of the project. In case any such event occurs, the effect of the same on the cost and time of the project. Identify and allocating the risk to the party who can manage it best. Steps or actions which can be taking to reduce the chances of the event occurring. Costs of addressing the risk have to be determined.

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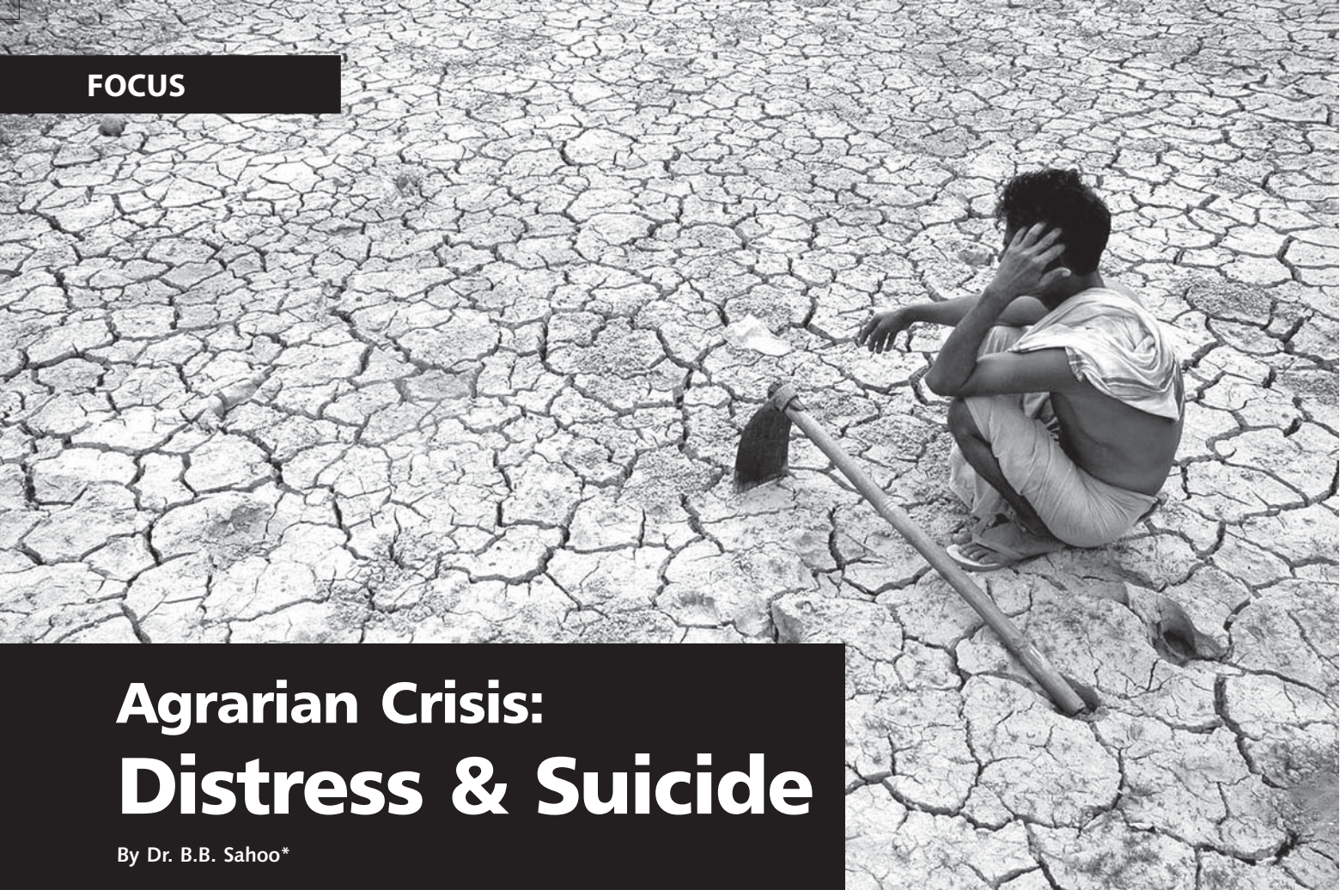
** Satyaveer Singh, MIS Expert, Asian Development Bank, TA-4890 IND, Mainstreaming of Public Private Partnerships at State Level*

*** Subah Singh Yadav, Chief Manager, Bank of Baroda, Zonal Officer, Lucknow*



# Agrarian Crisis: Distress & Suicide

By Dr. B.B. Sahoo*

Agriculture continues to play a predominant role in influencing the overall performance of the Indian economy. In spite of the advancement in chemical, biological and information fields, there has been a distinct slowdown in agricultural growth during the past two decades. By the year 2003-04, only 35.3 percent of the net sown area of 140.9 million hectares was utilized for double cropping. Further, even after five decades of planning, crop diversification in favour of remunerative cash crops is quite insignificant, which can be understood from the high proportion of area under different food grain crops[1]. Between 1990-91 and 2006-07, the annual rate of growth of food grains production at 1.2 percent was lower than that of population at 1.9 percent. The share of agriculture in the GDP has registered a steady decline from 36.4 percent in 1982-83 to 18.5 percent in 2006-07. Extension and other support services to crop cultivation have weakened. All these have resulted in poor performance of the sector leading to agrarian distress, manifested through migration, farmers' suicides and reduced participation in agricultural activities. Keeping this in view, an attempt has been made to focus on the current status of farmers and the likely strategies to address the constraints to development.

## Agrarian Distress

There are many dimensions of the present agrarian crisis. In terms of population, India stands at number two, but in terms of area, it stands at number seven in the world. By the year 2003-04, only 67.3 million hectares, which is 35.3 percent of the total cropped area, were under non-food grain crops[2]. While the workforce in agriculture has remained more or less stagnant[3], its contribution to nation's GDP has been steadily declining. It has also resulted in a declining ratio of worker productivity in agriculture to non-agriculture. On account of an increasing number of holdings and constant, and even declining cultivable land area, the burden of farmers has been increasing[4]. The land-to-labour ratio as well as income gains per capita have been reducing significantly.

India, in the second decade of planning, saw the advent of the green revolution. It encouraged undertaking massive investments in the agriculture sector and pursuing policies to accelerate the growth process. The expansion in irrigation, impressive technological advances and policies, and institutional support agriculture led to a sustained overall increase in agricultural production. The decade of the 1980s saw the diversification of agriculture from cereal to cash crops like cotton, oilseeds and also to horticulture and livestock. Thus, the major policy goals during the period between the 60s and 80s were on achieving self-sufficiency in food grains production, but it lost its flames towards the last part of the 80s. Since 1982-83 the public investment in irrigation, rural infrastructure and agricultural research has started declining and this declining trend dampened the growth perspective in agriculture sector. As a result, some of the positive gains of green revolution got erased and the constraints arising from the patterns of land ownership[5] and unequal access to irrigation water began to surface.

The crisis has been exacerbated further by rapid environmental degradation and plateauing of the existing agricultural technology. These factors impinge adversely on the production potential of the agricultural sector. The slowing down and stagnation of agricultural growth has adversely affected the income and employment of a vast majority of rural people dependent on agriculture. Scanty irrigation facility for the agriculture sector is another cause of concern. Out of the total 190.6 million hectares of gross sown area, only 76.8 million hectares of land have irrigation facilities and the remaining 113.8 million hectares have been cultivated in rain-fed conditions by the year 2003-04. Unlike irrigated agriculture, rain-fed agriculture is characterized by low levels of productivity. The existing irrigated areas are also experiencing serious water stress as both reservoir and ground water resources are depleting in many parts of the country. The growing demand for drinking water and other needs associated with rapid urbanization and industrialization further increases stress on available irrigation resources.

Soil erosion, water logging and shifting cultivation also cause land degradation. Similarly, excessive and unbalanced use of fertilisers and pesticides reduces soil fertility due to soil nutrient depletion. Among states, there are a few peak achievers in agricultural productivity. For instance, the worker's productivity in Punjab at Rs.35,087 during 2004-05 was 7.2 times that of Bihar and 5.3 times that of Madhya Pradesh. The workers' productivities in 11 major states are below the national average of Rs.12,371[6]. Thus, regional disparity is another factor increasing agrarian distress. This is further exacerbated by the growing differences in workers' productivity in agricultural activities and non-agriculture activities. For instance, at an all India level, the workers' productivity in non-agricultural activities at Rs.61,432 was 4.96 times higher than that of agricultural activities at Rs.12,371 in the year 2004-05[7]. All the more, income from agriculture is increasingly becoming inadequate to meet the basic consumption requirements of the farm family and it is more so for marginal farmers.

Since the early 90s, in order to benefit from global trade, some farmers have embarked on the production of remunerative cash crops without adequate knowledge on grades and standards. As big farmers are the most important information source for the common farmers, some of the small farmers are tempted to cultivate high valued commercial crops. Because of the implied investment requirements, these changes have tended to exclude most of the small farmers from participating in market growth. It is a fact that every farmer wants to sell his produce near the top price and when he is unable to achieve the goal of selling his produce, he becomes confused and this confusion leads to frustration. Many a time, when the prices of his produce sinks[8], he finds it difficult to manage the situation. Further, adverse weather conditions, unstable markets and poor profit margins are weakening the ability of farmers in producing traditional crops. Inappropriate application of inputs mix, ignorance on technical know-how and spurious use of fertilizer and pesticide add to farmers' woes. Inappropriate farm credit policy, support services and infrastructure base further accentuate the situation. As a result, most farmers are looking for alternatives. As the cost of cultivation of most of the commercial crops are relatively high, shortfall in yield and price of these crops has brought misery to the farmers in the form of increasing debt burden, distress sale and even, the extreme step of committing suicide. Some such incidents have been recently witnessed in states like Maharashtra, Andhra Pradesh and Karnataka. On the overall, agrarian distress is increasing.

## Studies on Agrarian Distress

Of late, some studies on agrarian distress have been conducted in the country. Major factors common to most of the findings on increasing agrarian distress are the following:

**Crop Related:** Based on their study, Rao & Suri[9] have shown that farmers in Andhra Pradesh, knowing well the risks involved in the cultivation of cotton and chillies, had taken up the cultivation of these two crops. Every year, they were loosing one or the other crop either due to bad monsoon, lack of water or pest attack. They were not able to recover their investments in the cultivation of these crops. Both paddy and cotton showed negative returns and chillies gave marginal return. While estimating loss, it was observed that small farmers followed by marginal farmers suffered the most. As the small and marginal farmers are more vulnerable to risk and uncertainty, when crop fails, debt burden gets accumulated and they find themselves in a difficult situation.

**Credit Related:** Rural areas are less organized in terms of available financial products. Low demand for credit, no/less documentation of property and small sized loan demand by the rural customers make the fund flow costly. A high cost of handling transactions by banks and increased travel requirement by customers (bankers also) further aggravates the situation. As a result, the number of bank branches in rural areas has been declining. For instance, in 1991, there were 35,206 rural branches, which was 58.4 percent of the total bank branches in the country, but in 2006, its number decreased to 30,579, i.e., 44 percent of the total bank branches. In the present liberalized era, farmers are influenced by the market forces of demand and supply and have started cultivating commercial crops. When the cultivation of commercial crops requires more investment and bankers have been shying away from financing agriculture, the farmers are forced to depend on informal sources. But the high cost of debt servicing and harassment for repayment of loans make the life of the common farmer miserable.

**Marketing & Price Related:** Marketing is another factor increasing farmers' worry. In the absence of secure and ready markets, farmers are forced to opt for distress sale. When the cost of investment in producing agricultural commodities is rising and the profit margin is declining, the farmer's ability to continue as a farmer gets shattered. In the process, the middlemen reap the benefit and the common farmers are exploited. The Minimum Support Price (MSP) given to farmer is also found to be inadequate. In some cases, farmers sell their produce to middlemen at lower prices than the MSP.

**Extension Services Related:** The extension services provided to farmers are very poor. They do not get proper information on package of practices,

demand for their produces and benefits of crop diversification. In a piece-meal manner, they get the technical advice from the local input dealers, who are not technically qualified, and their prescriptions are guided by the available stock of seeds, fertilizers and pesticides with them.

**Other Factors:** Besides cultivation, the small and marginal farmers do not have any other option for earning their livelihood. Although from time to time, the Government has taken many developmental initiatives, they are insufficient to provide meaningful living to the commoners. Many times, the real recipients are not necessarily those who actually require it. Other factors, which adversely impact on the small farmers, are the following:

- No supplementary livelihood options in non-farm sector;
- Absence of safety nets for the small and marginal farmers;
- Increasing expenditure on marriage and other social functions;
- Increasing expenditure on illness; and,
- Inadequate risk mitigation measures

Table 1 presents the major findings of some studies on increasing agrarian distress and farmers' suicides in some selected states like Andhra Pradesh, Punjab, Maharashtra and Kerala.

### Farmers' Suicides

Suicides are normally influenced by strains on an individual due to a variety of psychological, social and economic reasons. The number of suicides in the country during the decade 1996-2006 increased from 88,241 in 1996 to 1,18,112 in 2006, which was 33.8 percent. During 2006, collectively 7 states, i.e., West Bengal, Maharashtra, Andhra Pradesh, Tamil Nadu, Karnataka, Kerala and Madhya Pradesh, witnessed 71.4 percent of the total suicides in the country. Family problems and illness were reported as the main causes of suicide. While studying suicides by profession, it is observed that 41 percent of the total suicide victims were self-employed followed by housewives at 21.2 percent. Similarly, 69.9 percent of the total suicide victims had an education up to the middle level[1].

Table 2 presents year-wise farmers' suicide rates during the period between 2001 and 2006 in the top five states in the country. It is observed from the table that during the period, farmers' suicide rate was the highest in Chhatisgarh, followed by Maharashtra and Andhra Pradesh. Experts say that rising cost of investment, repetitive crop failure, high indebtedness, price volatility and distress sale are some of the factors increasing agrarian distress.

**Soil erosion, water logging and shifting cultivation also cause land degradation. Similarly, excessive and unbalanced use of fertilisers and pesticides reduces soil fertility due to soil nutrient depletion. Among states, there are a few peak achievers in agricultural productivity**

**Table 1: Causes of agrarian distress and farmers' suicides**

| State | Causes |
|---|---|
| Andhra Pradesh | Monsoon failure, increasing cost of cultivation, mono-cropping[1], lower yield and non-remunerative prices[2] |
| Punjab | Crop failure, lower yield, mounting debt burden, alcoholism, domestic discord, drug addiction[3] |
| Maharashtra | Crop failure, indebtedness, price fluctuation, poor extension network, decline in social position, conflicts, drug addiction, alcoholism and health problems[4] |
| Kerala | Crop failure, drought, flood, water logging, deficit rainfall, pest attack, decline in yield, increase in expenditure on fertilizer and pesticide, sharp drop in price of crops and decline in the quantity exported[5] |

**Table 2: Top five states with year-wise figure on farmers' suicide (Farmer suicide rate per one lakh farmer population)**

| Year | Chhatisgarh | Maharashtra | Andhra Pradesh | Karnataka | Madhya Pradesh |
|---|---|---|---|---|---|
| 2001 | 6.97 | 3.65 | 1.98 | 4.74 | 2.27 |
| 2002 | 5.83 | 3.76 | 2.46 | 4.21 | 2.25 |
| 2003 | 4.93 | 3.84 | 2.31 | 4.58 | 2.46 |
| 2004 | 6.33 | 4.10 | 3.39 | 3.21 | 2.83 |
| 2005 | 6.29 | 3.82 | 3.13 | 2.94 | 2.19 |
| 2006 | 6.49 | 4.28 | 3.24 | 2.57 | 2.45 |

*Source: National Crime Records Bureau; Sourced from the website*

### A State-Wise Analysis

In order to understand the drivers of agrarian distress and farmers suicides, 20 major states are selected and based on the incidence of farmers' suicides, they are divided into 'distressed states' and 'non-distressed states'. As the highest number of farmers' suicides (in terms of the farmers' suicide rate) has been reported in the states of Chhatisgarh, Maharashtra, Andhra Pradesh, Karnataka, Madhya Pradesh, Punjab and Kerala during 2001 and 2006, these 7 states have been categorized as 'distressed states' (DS). The remaining 13 states have been considered as 'non-distressed states' (NDS).

While analysing area and productivity of food grain crops, it is observed that both area and productivity have been declining in distressed and non-distressed states. However, the decline in distressed states is relatively high[1]. Similar observations were seen in the case of the productivity of food grain crops[2]. Table 3 presents some selected parameters relating to agriculture in both 'distressed' and 'non-distressed' states. To avoid irregularities, three year average data, i.e., from 2001-02 to 2003-04, has been used for the analysis. While analyzing per household data, it is observed that in spite of comparatively lower irrigated area, farmers in distressed states produce relatively more non-food grain crops. Further, the households in distressed states have the maximum increment in credit. When the situation is analysed from per hectare of land, it is observed that in spite of lower area under non-food grain crops and farm credit disbursement, the farmers in 'non-distressed' states could increase the crop output.

**As the highest number of farmers' suicides (in terms of the farmers' suicide rate) has been reported in the states of Chhatisgarh, Maharashtra, Andhra Pradesh, Karnataka, Madhya Pradesh, Punjab and Kerala during 2001 and 2006, these 7 states have been categorized as 'distressed states' (DS)**

**Table 3: Selected parameters relating to agriculture in 'Distressed' and 'Non-Distressed' states.**

| Particulars | Distressed States[1] | Non-Distressed States[2] | % Change |
|---|---|---|---|
| **Per household** | | | |
| Value of crop output (Rs.000) | 17.28 | 14.65 | 15.22 |
| Gross Sown Area (Hectare) | 1.51 | 1.09 | 27.81 |
| Gross Irrigated Area (Hectare) | 0.48 | 0.52 | **-8.33** |
| Area under non-food grain crops (Hectare) | 0.60 | 0.36 | 40.00 |
| Institutional credit (Rs.000) | 7.10 | 3.78 | 46.76 |
| **Per hectare** | | | |
| Value of crop output (Rs.000) | 11.42 | 13.49 | **-18.13** |
| Gross Sown Area (Hectare) | 1.28 | 1.39 | **-8.59** |
| Gross Irrigated Area (Hectare) | 0.32 | 0.48 | **-50.00** |
| Area under non-food grain crops (Hectare) | 0.40 | 0.33 | 17.50 |
| Institutional credit (Rs.000) | 4.69 | 3.47 | 26.01 |

In order to understand the relative importance of factors influencing agricultural income of the farmers' households, a regression equation has been fitted. In the absence of relevant information on value of crop output, the net state domestic product (NSDP) at factor cost from agriculture has been taken as the proxy for the value of output. Further, to arrive at the value of crop output per household, the NSDP from agriculture has been divided with the total farmers' household. Although there are a large number of variables, which influence the value of crop output, in the present exercise, four variables, i.e., gross sown area, gross irrigated area, area under non-foodgrain crops and institutional credit, which impact the crop output the most, are considered as the independent variables and a linear equation[1] has been used for the analysis.

In the case of 'distressed states', all the selected variables, except amount of credit disbursed, are found to have significant association with the value of output and collectively they explain 99 percent of the variations in the dependent variable. While the gross sown area and area under non-food grain crops are found to be significant at 10 percent level, gross irrigated area is found to be significant at 5 percent level[2]. When all other factors are constant, an increase in gross sown area by one hectare increases the value of agricultural

output by Rs.720. Similarly, keeping other factors constant, when irrigated area increases by one hectare, the value of agricultural output increases by Rs.11,940. It is disturbing to note that institutional credit, which is always considered to be an important factor influencing output, has turned out to be insignificant in influencing agricultural income. The inferences of such findings are that either the farmers have been influenced by a handful of progressive farmers for the cultivation of cash crops or they are influenced by the market forces of demand and supply. The inferences regarding credit may be that farmers in 'distressed states' are either producing high valued non-food grains in the land, which are not fit for their cultivation or not making proper end use of the credit. As a result, benefit-cost ratios in the cultivation of non-food grain crops are not remunerative. However, these observations are based on state level analysis. Location specific studies in areas like the Vidarbha region in Maharashtra and the Telengana region in Andhra Pradesh could throw meaningful insight into these issues.

In 'non-distressed states' all the selected independent variables are found to have significant association with the value of output and collectively they explain 74 percent of the variations in the dependent variable. While *gsa*, *gia* and *crd* are found to have positive association with the dependent variable, *anfc* is found to have negative association. Keeping other factors constant, when the gross sown area is increased by one hectare, the agricultural income increases by Rs.2,140 and when irrigated area increases by one hectare, value of agricultural output would increase by Rs.9,100. Similarly, when credit for agricultural purposes increases by Rs.1,000, value of output increases by Rs.2,100. However, the variable *anfc* is found to have negative association with output, which infers that farmers in 'non-distressed states' may be producing non-food grain crops in the land, which are not fit for the production of food grains. As a result, non-food grains cultivated in non-distressed states are not profitable. Further, the value of the elasticity for *anfc* is found to be (-) 0.04, which is very insignificant. When both distressed and non-distressed states are compared in terms of productivity, it is observed that per hectare yield in non-distressed states is 18.1 percent higher than that in the distressed states. Table 4 presents the details of the regression result.

**Table 4: Results of Regression Analysis**

| Particulars | Distress States | | Non-Distress States | |
|---|---|---|---|---|
| | Coefficient | Std. Error | Coefficient | Std. Error |
| Intercept | 2.26 | | 9.20 | |
| Gross Sown Area | 0.72*** | 3.04 | 2.14*** | 7.65 |
| Gross Irrigated Area | 11.94** | 3.53 | 9.10*** | 8.43 |
| Area under non-food grain crops | 2.34*** | 6.74 | -1.49*** | 11.94 |
| Credit disbursed | 0.92 | 0.47 | 0.21*** | 1.11 |
| $R^2$ | | 99% | | 74% |

** 1%, ** 5% and *** 10% d*egree of significance

**In 'non-distressed states' all the selected independent variables are found to have significant association with the value of output and collectively they explain 74 percent of the variations in the dependent variable**

## Conclusions

The basic conclusion that emerges from the analysis is that there are three significant factors influencing crop output: (a) gross sown area; (b) irrigation facilities; and (c) level of farmers' education. In the absence of the required infrastructure and support services like irrigation and extension services, farmers in distressed states were found to divert relatively more land in favour of different non-food grain crops. The finding of credit as an insignificant factor influencing crop output goes in a bad taste, which needs to be examined under local condition. The farmers may be *imparted education* on crop husbandry, i.e., suitability of land and climate for specific crops, costs and benefits, sources of credit, input-mix, availability of backward and forward linkages, marketing facilities/services, etc.

Although gross sown area is found to be an important factor increasing crop productivity and output, the scope for its expansion is limited[1]. Therefore, it is not advisable to bring more land under plough because it may endanger the space for other uses. However, gross sown area can be increased by increasing irrigation facilities. The Ninth Five Year Plan assessed the ultimate irrigation potential of the country at 140 million hectares[2], and by the year 2003-04, only 76.8 million hectares[3] have the benefit of irrigation. Therefore, *ample scope exists for increasing irrigation facilities*. Irrigation facilities can not only increase area under double crops but also offer opportunities for crop diversification and increase crop productivity. As the present level of investment in agriculture is not very significant, *public policy may be geared up for providing irrigation facility* for the additional 63.2 million hectares. *Watershed projects* may also be initiated on a priority basis. Further, the extension system is weak and the link between research and extension is found to be broken. As crop productivity depends not only on crop management and price policy but also on research activities like inventing, experimenting and popularizing higher yield potentials of different varieties, emphasis needs to be given on *Research and Development (R&D)*[4].

* The author is an Assistant General Manager in National Bank for Agriculture and Rural Development (NABARD), Head Office, Mumbai. The views expressed by the author in the paper are of his own and not of the institution he belongs to. E-mail: bbsahoo2k@yahoo.co.in

[1] 64.7 percent of the total gross cropped area of 190.6 million hectares was under different food grain crops during the year 2003-04.

[2] Centre for Monitoring Indian Economy Pvt. Ltd. (CMIE), Mumbai, April 2007

[3] In the year 2004-05, nearly 64 percent of the rural persons were from households whose major activity status was either self-employed in agriculture or agricultural labour.

[4] During 1960-61 and 2003, while the number of holdings had been increased from 50.77 million to 101.27 million, the area operated declined from 133.48 million hectares to 107.65 million hectares. As a result, the average size of holding has declined from 2.63 hectares in 1960-61 to 1.06 hectares in 2003.

[5] Out of the total 89.3 million farmer households in the country, small and marginal farmers constituted 75.0 million households (84.0 percent). Source: Situation Assessment Survey of Farmers, 2003, 59th Round, NSSO (January-December 2003)

[6] The states are Andhra Pradesh, Assam, Bihar, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu and Uttar Pradesh. (Source: NSSO, Employment and Unemployment Situation in India, 2004-05 and CSO, Gross State Domestic Product, 2004-05)

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[10] In Anantapur district, where 450 peasants have committed suicide since 2000, it was found that farmers were depending on single groundnut crop for their living. The groundnut is grown in 90 percent of the total cultivable land in the district. (Source: Why do Farmers commit suicide? The case of Andhra Pradesh, V.Sridhar, Economic and Political Weekly, April 22-28, 2006, Vol.XLI No.16, Page 1559-65

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[14] Analysis of Farmer Suicides in Kerala, S.Mohan Kumar, R.K.Sharma, EPW, April 22-28, 2006, Page 1553-58

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[16] In distressed states, area under food grain crops increased at an annual compound growth rate of 0.17 during 1980-81 and 1990-91 and it declined at an annual rate of 0.50 during 1990-91 and 2003-04. However, in non-distressed states, annual increase under food grain crops, which was 0.16 percent during 1980-81 and 1990-91, was (-) 0.28 percent during 1990-91 and 2003-04.

[17] In distressed states, the annual increase during 1980-81 and 1990-91 was 2.77 percent, and during 1990-91 and 2003-04, it was 1.58 percent. However, in the case of non-distressed states, the increase was 2.95 percent during 1980-81 and 1990-91 and 2.32 percent during 1990-91 and 2003-04.

[18] Chhatisgarh, Maharashtra, Andhra Pradesh, Karnataka, Madhya Pradesh, Kerala and Punjab

[19] Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttaranchal and West Bengal

[20] The linear equation of the form: $VO_{hh} = á + â_1 gsa + â_2 gia + â_3 anfc + â_4 crd + U_t$ has been considered for the per hectare analysis.

[21] That means, we reject Ho with 90% confidence for gsa and anfc respectively and reject Ho with 95% for gia and conclude that gsa, anfc and gia have significant effect on crop output.

[22] The net sown area at 140.9 million hectares is 46.1 percent of the reporting area and this is higher than that in most of the countries of the world.

[23] Ninth Five Year Plan Document

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# Real Time Gross Settlement: Need for Customers

By K. Kannusamy* and Sathish Kumar**

*Real time gross settlement systems (RTGS) are a funds transfer mechanism where transfer of money takes place from one bank to another on a 'real time' and on 'gross' basis. Settlement in 'real time' means payment transaction is not subjected to a waiting period. The transactions are settled as soon as they are processed. 'Gross settlement' means the transaction is settled on one-to-one basis without bunching with any other transaction. Once processed, payments are final and irrevocable. The RTGS system is suited for low-volume, high-value transactions. It lowers settlement risk, besides giving an accurate picture of an institution's account at any point of time.*

*The implementation of RTGS systems by Central Banks throughout the world is driven by the goal to minimize risk in high-value electronic payment settlement systems. In an RTGS system, transactions are settled across accounts held at a Central Bank on a continuous gross basis. Settlement is immediate, final and irrevocable. Credit risks due to settlement lags are eliminated.*

## Introduction

RTGS does not require Core Banking to be implemented across participating banks. Any RTGS would employ two sets of queues: one for testing funds availability, and the other for processing debit/credit requests received from the Integrated Accounting System. All transactions would be queued and submitted for funds availability testing on a First in First Out (FIFO) + Priority basis. With the rapid increase in competition amongst the numerous players in the financial area and changing government policies and financial innovations, it has become increasingly important that financial institutions have systems which are robust and up to the mark to support the demanding transaction levels. Some such systems are the Clearing, Payment and settlement Systems which take care of large-value inter-bank payments, foreign exchange clearing and settlements, securities clearing and settlements and derivative clearings.

## Definition

RTGS (Real Time Gross Settlement): A system that streamlines that settlement of large-value transactions between banks and other financial institutions. Instead of moving physical cash, the banks transfers funds electronically. When one bank transfers money to another, the funds are immediately credited to the second bank and debited to the first.

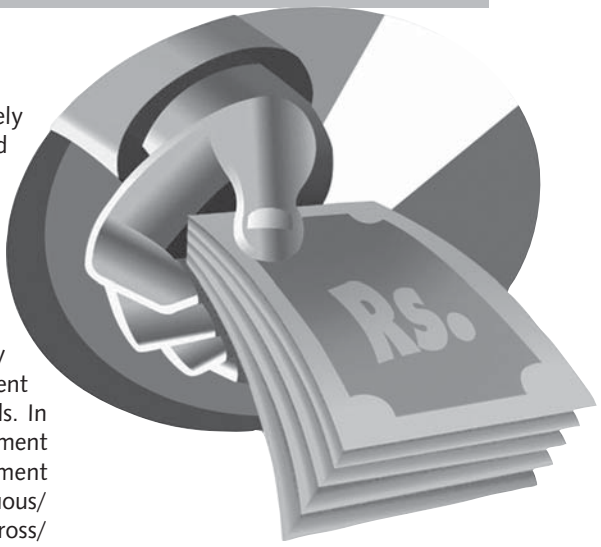
## What is RTGS?

Real Time Gross Settlement System (RTGS) is the ultimate in the payment and settlement architecture in any country primarily for online, real time inter bank payment and settlement of large value funds. In other words, this is an electronic payment processing environment where payment instructions are processed on continuous/ on real time basis and settled on gross/ individual transaction basis with out netting the debits against credits.

RTGS payment system can also be called as one in which payment instruction between banks are processed, settled individually and continuously throughout the day as per the timings fixed from time to time. (Between 9.00 a.m and 3.00 p.m daily and 9.00 a.m and 12.30 p.m. on Saturdays as of now) RTGS works on all days except on Sundays and National holidays across states.

### Working of RTGS System

Each participant (here the Bank) of the RTGS will be required to open a dedicated settlement account for putting through its RTGS transactions. This account will be an intra day account, i.e, it would be operational only during the




**The proposed RTGS system provides for the maintenance of participant wise payment queues in which payment transactions will be held in first-in-first-out basis at RTGS Branch of our bank**

duration of RTGS day. The account will be funded at the start of the day (SOD) from a current account the participant holds under the present system at Deposit Account Department, RBI, and Mumbai. Balances in the RTGS settlement account at the end of the day (EOD) of the RTGS day are swept back to the participants current account and there by zeroing the balance in RTGS settlement account. The system enables the participants to place standing instructions with DAD (Deposit Account Department) , Mumbai to fund their RTGS settlement account each morning duly specifying amount or percentage of balance to be transferred to the RTGS settlement account every day at SOD. The system also provides to fund the RTGS settlement account during the day from the participant's current account.

Transactions emanating from a participant are ordinarily expected to be settled within two hours after it is received by beneficiary bank, which is the essence of the real time system. The proposed RTGS system provides for the maintenance of participant wise payment queues in which payment transactions will be held in first-in-first-out basis at RTGS Branch of our bank (Liquidity Manager). However, to enable the participants to take care of the urgent time critical payments and to enable more effective funds management, the system allows the participant to assign priories to their payment messages and there by, enabling a particular transaction to be processed before another transaction which was submitted earlier.

The system, Liquidity Manager, also provides for facilities to the participants to view their respective transactions held in their payment queues, cancel such transactions and even change their priorities. However, participants can only view out going transactions on their own payment queues. They can not view other participant's queues or their own pending incoming payment transactions. The proposed RTGS system provides for wide array of transaction types which can be flexibly deployed to meet varying requirements.

**Benefits of RTGS**

**To the Economy:** RTGS will reduce the systemic risk that exists in the present settlement systems like cascading affect on banks due to failure of one bank to meet it's settlement commitments. It improves confidence of outside agencies like the World Bank in the Indian economy. It enables efficient settlements and avoids settlement delays

**To the Banks:** It offers immediate and irrevocable settlement. It provides for high value inter bank funds transfer. It has the potential to formulate new products by individual banks based on RTGS.

**To Customers:** They can get new banking services based on reliable high value funds transfer system. The RTGS solution provides for a separate transaction type which can be used to transmit the customer information along with the payment message to the beneficiary's bank in a structured format.

**RTGS – Salient Features**

RTGS is a payment gateway under the close supervision of RBI, working on the electronic message communicating system. Each bank will have a central hub, which is connected to RTGS. Inside each branch the message communication takes place through individual Wide Area Network. RTGS will use the secured INFINIT network of RBI.

It uses the Secured Financial Messaging Service (SFMS) message for the communication between Internal Core banking solutions (for us Anywhere Banking) and the RTGS application. Participants will have to maintain a dedicated RTGS settlement account with RBI for outward and inward RTGS payments. This account will be an intra day account. The account will be funded at the start of day from a current account held with RBI, Mumbai.

The balance in this account at the end of day is swept back to the current account and thereby zeroing the RTGS settlement account. Payment transactions emanating from a participant are processed by the RTGS strictly on First in First Out (FIFO) basis.

However to enable the participants to take care of urgent or time critical payments and to enable more effective fund management, the system allows the participants to assign priorities to their payment messages and thereby enabling a particular transaction to be processed before other transactions, which was submitted earlier to the system. Payment transactions emanating from a participant are to be settled immediately when it is received. However the possibility of some transactions not being immediately settled cannot be completed ruled out. To meet such exigencies, the proposed RTGS system provides for maintenance of payment queues in which payment transactions will be held in FIFO order within priority pending settlement. In order to meet intra day liquidity, RBI at its discretion and under terms and conditions to be specified from time to time will provide liquidity against fully collateralized assets (Govt. Secs) at a charge per transactions.

**Implementation of RTGS**

An RTGS branch with Code 1250 commenced operations as Nodal Office for RTGS transactions under Funds & Forex Department, Mumbai. All inter-bank and Customer Payment transactions from RTGS enabled branches shall be routed through this RTGS Nodal Office. All Customer Payment transactions emanating from the identified RTGS branches and Inward Remittances to identified RTGS Braches are centralized at RTGS Branch (1250), Mumbai. The interface between the bank's software and RTGS software are provided by our vendors M/s Laser Soft (Branch software) and are operational zed.

The following types of Customer Transactions are being routed through RTGS system by Fort and Opera House branches LIVE:

- All Inter bank transactions
- Customer Payment transactions
- Own Account Transfers
- Net Clearing

We have also implemented RTGS branch software for effecting RTGS Customer Payment and Inter-bank Payment transactions from 521 identified branches with nominal charges. RTGS System has already attained the status of the largest electronic fund transfer system in the country and 85 banks are offering RTGS based Customer services from 13,348 branches covering all most cities/towns across the country. Once branches are identified and communicated to RBI, each branch will

be allotted with IFSC (Indian Financial System Code) by RBI, which is an 11 character code (Example ANDB0001028, first four digits, ANDB, will be Bank Identification and the last four digits represents branch code).

As per the Business Schedule of RTGS transactions the timings are as under with banks Cut-off time

| Day | Cut-Off time at Hrs for Customer Payment |
|---|---|
| Week Days | 16.00<br>(Monday to Friday) |
| Saturdays | 11.30 |

## Conclusion

The RTGS is a system, which provides real-time online settlement of payments among banks and financial institutions. In this system payment instructions between banks are processed and settled individually and continuously throughout the day. A lag between the time at which information is made available to receiving banks and the time at which settlement takes place may have important risk implications in large funds transfer system. This is in contrast to net settlements where payment instructions are processed throughout the day but inter-bank settlement takes place only afterwards typically at the end of the day. Payee banks and their customers receive funds with certainty, or so-called finality, during the day, enabling them to use the funds immediately without exposing themselves to risk.

To initiate a funds transfer, the sending bank dispatches a payment message, which is subsequently routed to the central bank and to the receiving bank as the system process and settles the transfer. RTGS system settles payments on a transaction-by-transaction basis as soon as they are accepted by the system. RTGS system does not create credit risk for the receiving participant because the settlement takes place individually. RTGS system can require relatively large amounts of intra-day liquidity because participants need sufficient fund in the settlement account to cover their outgoing payments. The cost of intra-day liquidity depends on variables such as amount required, the opportunity cost of maintaining liquid balances and the cost of intra-day credit. Once RTGS is implemented all the inter-bank settlement will be done on a real time basis.

** Lecturer, PG & Research Department of Commerce, Gobi Arts & Science College, Gobichettipalayam - 634 453.*

*** Research Scholar, PG & Research Department of Commerce, Gobi Arts & Science College, Gobichettipalayam - 634 453.*

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# Honesty ki Jhappi

## Opportunity for India's Social Revolution

**Prajapati Sudhirkumar Rameshbhai**

### Background

In Gujarat an excellent proverb goes like this *"Medicine may be provided free of cost but liquor must not"* Free medicine may bring back the life of a patient and free liquor may ruin the whole life of healthy person, his family and harm the social structure. And therefore no one in the world has built a free liquor shop but there are millions of hospitals in the world which are charging nothing for treatment. The Central Government's debt waiver and debt relief scheme - 2008 for farmers, though well-intentional, is ill-targeted and half heartedly managed, thus encouraging dishonest people to remain dishonest and honest people to become dishonest. This way it is going to do more harm than good.

Real experience the in wake of the recent announcement by the central government's scheme for debt waiver and debt relief to the farmer has brought great relief to millions of farmers across the country who in any case are on the verge of collapse under vicious circles of debts. This will give them a second chance to start their lives.

There are certain groups and schools of thought showing apprehension that this may lead to higher NPAs and may inflict culture of dishonesty. There is no empirical evidence available to support their arguments as the Indian farmer and the Indian middleclass who are struggling everyday to earn their livelihoods have shown a higher repayment rate compared to other classes of borrowers. The sum of non performing assets of all farmers at the National level would not be anywhere near to the sum of settlement made by Financial Institutions/Banks for commercial lending in a particular year. One should also not forget that there is a sizable amount of subsidy that people in metros and semi metros are enjoying everyday. The examples are cooking gas, petrol, electricity, roads, higher educations, medical facilities and almost all the essentials services which are either provided by Government directly or through its Public Sector Undertakings. On the other hand farmers have very little access to all the above stated essential services. Except fertilizer, a sizable chunk of the total subsidy bill is cornered away by metro and semi-metro residing Indians, who otherwise can afford full cost of services.

The detail analysis of composition of class of borrowers has revealed very dark pictures, in terms of pricing of products and services provided by Financial Institutions. Big industrial houses are getting loans at less than deposit cost. It may be a wise decision on the part of financial institutions to ensure the safety of the money and that it is also cost effective, as transaction costs are very negligible. But banks are not there to just lend to big fish and thus make them even bigger day-by-day at the cost of depositors. The small and marginal borrowers like farmers, artisans and self-help groups must be given their due share as they are providing more self employment and direct employment. In many parts of the country where education and economic development is low, people are not willing to visit banks due to very low levels of awareness and very strong presence of local money lenders who run in parallel with the banking system. Farmers feel more at home with local money lenders, than with finance which includes long forms and many documents etc. This easy finance comes at very high cost, but the Indian Farmer is well enough educated in order to to understand the cost of capital or even rates of interest terms.

### Issues

Having said that, the major concern for all concerned i.e. Banks, Financial Institutions, Government and Policy makers, is the growing culture of dishonesty? Are small borrower's always expecting a waiver scheme instead of putting their borrowed money in asset-creation and returning it to Banks/ Lending institutions?

There are many borrowers who are feeling fooled by paying debt regularly and then there are dishonest people who are moving around with their head held high claiming themselves as smart people. The honest borrowers are now seriously thinking to have maximum debt (agriculture related) and not to return it, more as part of psychology revenge than economy difficulties. It is well established and well documented fact that rural people are taking decisions by the collective consultation process and implementing that decision collectively, be it negative or positive, and therefore it is likely that the social atmosphere at the village level is going to downgrade. No healthy society can afford to let this happen. It seems the whole society at the village level would spend more time in planning dishonesty rather than on their farming requirements.

### National Strategy

No forward looking society can afford to see its society downgrade its moral values like playing with public money. Here, the role of policy makers and right thinking people is immense and should be more proactive.

In recent times the UPA Government has been emerging as an "PROACTIVE POLICY MAKER GOVERNMENT". In last budget the proposal regarding 1percent subvention to farmer who are paying their dues regularly is step in right direction. Government must come out with few more such schemes where honesty and hard working may be the main criteria for life rather than dishonesty. I am suggesting the following scheme in my personal capacity.

### "Honesty Rating Yojana"

To understand this scheme we may call it *"Honesty Rating Scale System"* for technical purpose. Under this scheme Banks may be directed to introduce variable rates of interest for borrowers, similar to 'AAA,' 'AA,' and 'A' rated companies. The higher the honesty, the lower the rate of interest. To institutionalize the honesty culture, Government may rate villages and incentives may be provided for scoring above the minimum level. The rating of the individual and village needs to be reviewed at fixed intervals and appropriate publicity must be given so it can make an impact of 'Statementship' in the whole society about borrower/s. A locally elected leader may facilitate Sarpanch of the village by an organizing function. A trophy should also be awarded to Gram Panchayat for showing higher level of collective honesty level. The concerned Bank could also participate in the process, as the Bank too would be a major beneficiary.

To understand this, let us take an example. Suppose in Dena Bank, Chandarni rural branch, and a customer named Mr. Dayabhai Patel, who has been taking loans for the last six years and has been paying regularly and his account has been rated by the branch as regular account. In the present situation Mr. Dayabhai Patel may feel guilty about a paying loan so religiously, as defaulters are getting benefits and not regular borrowers like him. The Bank may announce an "Honesty Rating Scale' scheme, where every farmer like Mr. Dayabhai Patel may get finance at 0.25 percent lower than normal rate, as he is adding profit to the Bank every year by paying his loan regularly and the Bank is saving on litigation and NPA related procedures (Man hours and other expenses). Society as a whole will also put them in positive thinking and honesty revolution will start. This will change the whole atmosphere at ground levels. This way honest farmers may get incentives on an ongoing basis for returning the public money. At an individual level, Mr. Dayabhai Patel will also feel proud of the status given to him as this status has been given to him by the present government.

To percolate this culture from the individual level up to society as whole, Government may provide some clauses under the scheme for village, for cooperative society (if all members are borrowers under any scheme), for self-help groups and any other classes of customers where they find an opportunity.

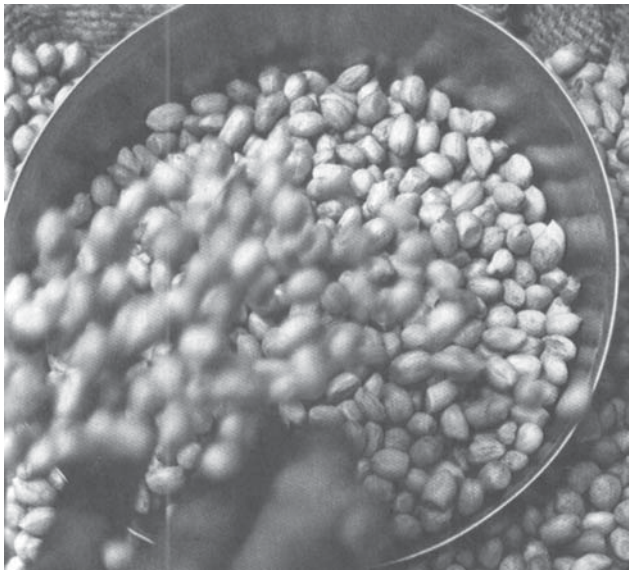
To understand this let us take another example: We will continue with Mr. Dayabhai Patel who is resident of Village Chandarni which has a population of two thousand. Just for academic purposes, if 90 percent of borrowers are repaying their loans as per sanctioned terms and conditions, Banks may announce differential rate of interest for any borrowers of the village except those 10 percent (remember we are here to promote habit of repaying and honesty and therefore we are not including the 10 percent who don't have a good track record of repayment) who have not paid their loan as per agreed to written terms and conditions. This rate of interest would be even lower than individuals who have scored higher on the honesty scale. In this case, the rate of interest for 90 percent of the borrowers of Village Chandarni would be say 0.35 percent lower than the normal rate of interest. Mr. Dayabhai Patel may get dual benefit, one, as he himself is honest and now as the whole village has been awarded as honest village, he will get 0.10 percent more concession as he also contributed in spreading the message of culture of repayment.

### Conclusion

It is very difficult to unlearn and learn new things, particularly when financial stacks are involved. However, countries like India where literacy, poverty, unemployment and empowerment of people are very low in rural area, we need to take a long term policy initiation because the coming generation must not blame us for not trying honesty. This will not only help Government to deal with bad debts but it has also potential to bring in social revolution. We as a nation will also be able to change our perception as a proactive nation in promoting its human values through such steps.

**Prajapati Sudhirkumar Rameshbhai, Marketing Manager, Dena Bank*

# Statistical Overview of Agriculture Production in India



**Fish production in India in 1997-98 to 2006-07**

| Year | Marine | Inland | Total |
|---|---|---|---|
| 1997-98 | 29.50 | 24.36 | 53.88 |
| 1998-99 | 26.96 | 26.02 | 52.98 |
| 1999-00 | 28.52 | 28.23 | 56.75 |
| 2000-01 | 28.11 | 28.45 | 56.56 |
| 2001-02 | 28.30 | 31.26 | 59.56 |
| 2002-03 | 29.90 | 32.10 | 62.00 |
| 2003-04 | 29.41 | 34.58 | 63.99 |
| 2004-05 | 27.79 | 35.25 | 63.05 |
| 2005-06 | 28.16 | 37.56 | 65.72 |
| 2006-07(P) | 30.24 | 38.45 | 68.69 |

*(P) Provisional*
*Source: Department of Animal Husbandry & Dairying, New Delhi*

**All-India area, Production and Yield of Nine Oilseeds from 1997-98 to 2007-08 alongwith percentage coverage under irrigation**

| Year | Area | Production | Yield% | Coverage under Irrigation |
|---|---|---|---|---|
| 1997-98 | 26.12 | 21.32 | 816 | 24.3 |
| 1998-99 | 26.23 | 24.75 | 944 | 23.2 |
| 1999-00 | 24.28 | 20.72 | 853 | 25.2 |
| 2000-01 | 22.77 | 18.44 | 810 | 23.0 |
| 2001-02 | 22.64 | 2.066 | 913 | 24.3 |
| 2002-03 | 21.49 | 14.84 | 691 | 22.7 |
| 2003-04 | 23.66 | 25.19 | 1064 | 24.5 |
| 2004-05 | 27.52 | 24.35 | 885 | 26.6 |
| 2005-06 | 27.86 | 27.98 | 1004 | 28.0 |
| 2006-07 | 26.51 | 24.29 | 916 | NA |
| 2007-08* | 26.54 | 28.83 | 1086 | NA |

*Area-Million Hectare; Production - Million Tonnes Yield - Kg./Hectare*
** Advance Estimates as released on 09.07.2008*
*Note: 1. The yield rates given above have been worked out on the basis of production & area figures taken in '000 units.*
*2. Date for 1950-51 to 1969-70 relate to total of five major oilseeds viz. groundnut, castorseed, sesamum, rapeseed & mustard and linseed.*

**All-India production of Milk, Eggs and Wool from 1997-98 to 2006-07**

| Year | Milk (Million tonnes) | Eggs (Billion Nos.) | Wool (Million Kgs.) |
|---|---|---|---|
| 1997-98 | 72.1 | 28.7 | 45.6 |
| 1998-99 | 75.4 | 29.5 | 46.9 |
| 1999-00 | 78.3 | 30.4 | 47.9 |
| 2000-01 | 80.6 | 36.6 | 48.4 |
| 2001-02 | 84.4 | 38.7 | 49.5 |
| 2002-03 | 86.2 | 39.8 | 50.5 |
| 2003-04 | 88.1 | 40.4 | 48.5 |
| 2004-05 | 92.6 | 45.2 | 44.6 |
| 2005-06 | 97.1 | 46.2 | 44.9 |
| 2006-07(P) | 100.9 | 50.7 | 45.1 |

*Source:Department of Animal Husbandry & Dairying, New Delhi*

### All-India production and yield of jute and mesta from 1997-98 to 2007-08

| Year | Area | Production | Yield |
|---|---|---|---|
| 1997-98 | 1.11 | 11.02 | 1702 |
| 1998-99 | 1.03 | 9.81 | 1722 |
| 1999-00 | 1.04 | 10.56 | 1836 |
| 2000-01 | 1.02 | 10.56 | 1837 |
| 2001-02 | 1.05 | 11.68 | 2007 |
| 2002-03 | 1.04 | 11.28 | 1960 |
| 2003-04 | 1.00 | 11.17 | 2008 |
| 2004-05 | 0.92 | 10.27 | 2019 |
| 2005-06 | 0.90 | 10.84 | 2173 |
| 2006-07 | 0.94 | 11.27 | 2170 |
| 2007-08* | 0.96 | 11.18 | 2093 |

*Note: figures for 1950-51 & 1951-52 relate to jute crop only.*
** Advance estimates as released on 09.07.2008*
*Note: The yield rates given above have been worked out on the basis of production & area figures taken in '000 units.*

### All-India area, production and yield of sugarcane from 1997-98 to 2007-08 alongwith percentage coverage under irrigation

| Year | Area | Production | Yield | % Coverage under irrigation |
|---|---|---|---|---|
| 1997-98 | 3.93 | 279.54 | 71134 | 91.3 |
| 1998-99 | 40.5 | 288.72 | 71203 | 91.7 |
| 1999-00 | 4.22 | 299.32 | 70935 | 92.0 |
| 2000-01 | 4.32 | 295.96 | 68577 | 92.1 |
| 2001-02 | 4.41 | 297.21 | 67370 | 91.6 |
| 2002-03 | 4.52 | 287.38 | 68576 | 91.3 |
| 2003-04 | 3.93 | 233.86 | 59880 | 90.7 |
| 2004-05 | 3.66 | 237.38 | 59380 | 90.7 |
| 2005-06 | 4.20 | 281.17 | 66928 | 92.5 |
| 2006-07 | 5.151 | 355.52 | 69022 | NA |
| 2007-08* | 5.04 | 340.56 | 67531 | NA |

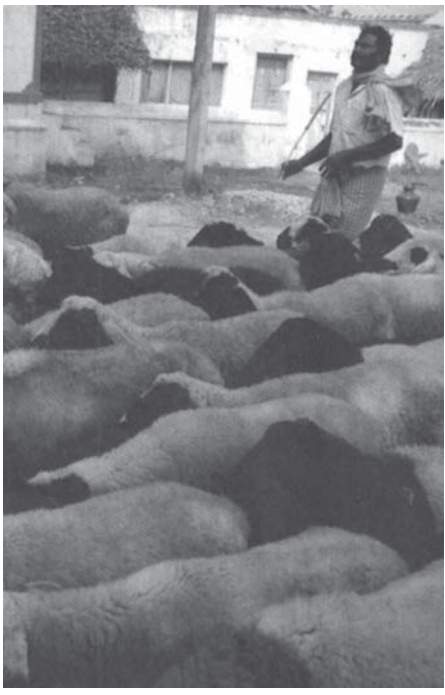
** Advance estimates as released on 09.07.2008*
*Note: The yield rates given above have been worked out on the basis of production & area figures taken in '000 units.*

### Targets and achivement of production of Major Crops during Tenth (Xth) Five Year Plan (2002-03 to 2006-07) and 2007-08

| | 2002-03 | | 2003-04 | | 2004-05 | | 2005-06 | | 2006-07 | | Xth Plan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop | Target | Achivements | Target | Achivements | Target | Achivements | Target | Achivements | Target | Achivements | Target | Achivements |
| Rice | 93.00 | 71.82 | 93.00 | 88.53 | 93.50 | 83.13 | 87.80 | 91.79 | 92.80 | 93.35 | 460.10 | 428.62 |
| Wheet | 78.00 | 65.76 | 78.00 | 72.15 | 79.50 | 68.64 | 75.53 | 69.35 | 75.53 | 75.81 | 396.56 | 351.71 |
| Coarse Cereals | 33.00 | 26.07 | 34.00 | 37.60 | 36.80 | 33.46 | 36.52 | 34.06 | 36.52 | 33.92 | 176.84 | 165.11 |
| Pulses | 16.00 | 11.13 | 15.00 | 14.91 | 15.30 | 13.16 | 15.15 | 13.39 | 15.15 | 14.20 | 76.00 | 66.76 |
| Foodgrains | 220.00 | 174.77 | 220.00 | 213.19 | 225.10 | 198.36 | 215.00 | 18.06 | 220.00 | 217.28 | 1100.10 | 1012.20 |
| Oilseeds | 27.00 | 14.84 | 24.70 | 25.29 | 26.20 | 24.35 | 26.58 | 27.98 | 29.40 | 24.29 | 133.88 | 116.75 |
| Sugarcane | 320.00 | 287.38 | 320.00 | 237.31 | 270.00 | 237.09 | 237.50 | 281.17 | 270.00 | 355.52 | 1417.50 | 1398.47 |
| Cotton# | 15.00 | 8.62 | 15.00 | 13.87 | 15.00 | 16.43 | 16.50 | 18.50 | 18.50 | 22.63 | 80.00 | 80.05 |
| Jute & Mesta @ | 12.00 | 11.28 | 12.00 | 11.23 | 11.80 | 10.27 | 11.28 | 10.84 | 11.28 | 11.27 | 58.36 | 54.89 |

** Advance Estimates as released on 09.07.2008*
*# Million Bales of 170 kg each; @: Million Bales of 180 kg. each*

## Livestock Population in India



| Species | 1951 | 1956 | 1961 | 1966 | 1972 | 1977 | 1982 | 1987 | 1992 | 1997 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cattle | 155.3 | 158.7 | 175.6 | 176.2 | 178.3 | 180.0 | 192.5 | 199.7 | 204.6 | 198.8 | 185.2 |
| Adult Female Cattle | 54.4 | 47.3 | 51.0 | 51.8 | 53.4 | 54.6 | 59.2 | 62.1 | 64.4 | 63.6 | 64.5 |
| Buffalo | 43.4 | 44.9 | 51.2 | 53.0 | 57.4 | 62.0 | 69.8 | 76.0 | 84.2 | 89.9 | 97.9 |
| Adult Female Buffalo | 21.0 | 21.7 | 24.3 | 25.4 | 28.6 | 31.3 | 32.5 | 39.1 | 43.8 | 46.8 | 51.0 |
| Total Bovins | 198.7 | 203.6 | 226.8 | 229.8 | 235.7 | 242.0 | 262.4 | 275.8 | 289.0 | 289.0 | 283.4 |
| Sheep | 39.1 | 39.3 | 40.2 | 42.4 | 40.0 | 41.0 | 48.8 | 45.7 | 50.8 | 57.5 | 61.5 |
| Goats | 47.2 | 55.4 | 60.9 | 64.6 | 67.5 | 75.6 | 95.3 | 110.2 | 115.3 | 122.7 | 124.4 |
| Horses & Ponies | 1.5 | 1.5 | 1.3 | 1.1 | 0.9 | 0.9 | 0.9 | 0.8 | 0.8 | 0.8 | 0.8 |
| Camels | 0.6 | 0.8 | 0.9 | 1.0 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 0.9 | 0.6 |
| Pigs | 4.4 | 4.9 | 5.2 | 5.0 | 6.9 | 7.6 | 10.1 | 10.6 | 12.8 | 13.3 | 13.5 |
| Mules | 0.1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 |
| Donkeys | 1.3 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.9 | 0.6 |
| Total Livestock | 292.8 | 306.6 | 335.4 | 344.1 | 353.6 | 369.0 | 419.6 | 445.3 | 470.9 | 485.4 | 485.0 |
| Poultry | 73.5 | 94.8 | 114.2 | 115.4 | 138.5 | 159.2 | 207.7 | 275.3 | 307.1 | 347.6 | 489.0 |
| Dogs | NC | NC | NC | NC | NC | NC | 18.5 | 18.0 | 21.8 | 25.6 | 29.0 |

*NC: Not Collected*
*Note: Total Bovins include Yaks and Mithans*
*Source: Department of Animal Husbandry, Dairying & fishries, New Delhi.*

## All-India Area, Production and Yield of Rice from 1997-98 to 2007-08 alongwith percentage coverage under Irrigation

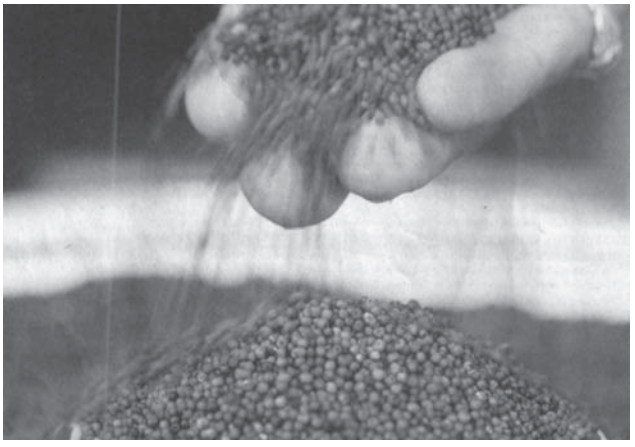
| Year | Area | Production | Yield | % Coverage under irrigation |
|---|---|---|---|---|
| 1997-98 | 43.45 | 82.53 | 1900 | 50.8 |
| 1998-99 | 44.80 | 86.08 | 1921 | 52.3 |
| 1999-00 | 45.16 | 89.68 | 1986 | 53.9 |
| 2000-01 | 44.71 | 84.98 | 1901 | 53.6 |
| 2001-02 | 44.90 | 93.34 | 2079 | 53.2 |
| 2002-03 | 41.18 | 71.82 | 1744 | 50.2 |
| 2003-04 | 42.59 | 88.53 | 2077 | 52.6 |
| 2004-05 | 41.91 | 83.13 | 1984 | 54.7 |
| 2005-06 | 43.66 | 91.79 | 2102 | 56.0 |
| 2006-07 | 43.81 | 93.35 | 2131 | NA |
| 2007-08* | 43.77 | 96.43 | 2203 | NA |

** Advance estimates as released on 09.07.2008*
*Note: The yield rates given above have been worked outon the basis of production & area figures taken in '000 units.*

## All-India Area, Production and Yield of Total Pulses from 1997-98 to 2007-08 alongwith percentage coverage under Irrigation

| Year | Area Million hectare | Production Million Tonnes | Yield kg./ Hectare | % Coverage under irrigation |
|---|---|---|---|---|
| 1997-98 | 22.87 | 12.98 | 567 | 11.3 |
| 1998-99 | 23.50 | 14.91 | 634 | 12.1 |
| 1999-00 | 21.12 | 13.42 | 635 | 16.1 |
| 2000-01 | 29.35 | 11.08 | 544 | 12.5 |
| 2001-02 | 22.01 | 13.37 | 607 | 13.3 |
| 2002-03 | 20.50 | 11.13 | 543 | 14.4 |
| 2003-04 | 23.46 | 14.91 | 635 | 13.6 |
| 2004-05 | 22.76 | 13.13 | 577 | 13.9 |
| 2005-06 | 22.39 | 13.39 | 598 | 15.0 |
| 2006-07 | 12.19 | 14.20 | 612 | NA |
| 2007-08* | 28.86 | 15.12 | 638 | NA |

** Advance estimates as released on 09.07.2008*
*Note: The yield rates given above have been worked outon the basis of production & area figures taken in '000 units.*



## All-India Area, Production and Yield of Sunflower from 1997-98 to 2007-08 alongwith percentage coverage under Irrigation

| Year | Area Million hectare | Production Million Tonnes | Yield kg./ Hectare | % Coverage under irrigation |
|---|---|---|---|---|
| 1997-98 | 1.74 | 0.89 | 548 | 21.6 |
| 1998-99 | 1.82 | 0.94 | 517 | 20.1 |
| 1999-00 | 1.29 | 0.69 | 538 | 23.5 |
| 2000-01 | 1.07 | 0.65 | 602 | 27.6 |
| 2001-02 | 1.18 | 0.68 | 577 | 24.1 |
| 2002-03 | 1.64 | 0.87 | 531 | 22.9 |
| 2003-04 | 2.01 | 0.93 | 464 | 15.4 |
| 2004-05 | 2.17 | 1.19 | 549 | 26.0 |
| 2005-06 | 2.34 | 1.44 | 615 | 24.9 |
| 2006-07 | 2.16 | 1.23 | 567 | NA |
| 2007-08* | 1.88 | 1.44 | 694 | NA |

## All-India Area, Production and Yield of coarse cereals from 1997-98 to 2007-08 alongwith percentage coverage under Irrigation

| Year | Area Million hectare | Production Million Tonnes | Yield kg./ Hectare | % Coverage under irrigation |
|---|---|---|---|---|
| 1997-98 | 30.83 | 30.40 | 988 | 11.0 |
| 1998-99 | 29.34 | 31.34 | 1068 | 12.0 |
| 1999-00 | 29.34 | 30.33 | 1034 | 12.6 |
| 2000-01 | 30.26 | 31.06 | 1027 | 12.5 |
| 2001-02 | 29.52 | 33.36 | 1181 | 11.3 |
| 2002-03 | 26.99 | 26.07 | 966 | 11.0 |
| 2003-04 | 30.80 | 37.60 | 1221 | 6.6 |
| 2004-05 | 29.03 | 33.47 | 1153 | 6.6 |
| 2005-06 | 29.01 | 34.07 | 1172 | 13.0 |
| 2006-07 | 28.71 | 33.92 | 1182 | NA |
| 2007-08* | 28.72 | 40.73 | 1418 | NA |

** Advance estimates as released on 09.07.2008*

*Area-Million Hectares; Production - Million Tonnes Yield-Kg./Hectare*
** Advance estimates as released on 09.07.2008*
*Note: The yield rates given above have been worked out on the basis of production & area figures taken in '000 units.*

# AGRI NEWS

## 'Reject Bt Brinjal as Poison'

"Release of Bt Brinjal would be the beginning of the end of Indian agriculture." This voice against genetically-modified food got louder with acclaimed scientist Shiv Chopra, who fought against bovine growth hormone in Canada and got it banned, supported the cause of rejecting "the poisoned food."

Speaking at a public seminar on the adverse impact of genetically modified food on health, Chopra said that a majority of people who will be eating Bt Brinjal would be oblivious of the fact that they are feeding on poison.

"Bt is toxic and there are serious questions being raised on the long term implications of genetically modified food products. The government is bowing to the pressure of foreign companies who are offering to set up base in the country and promising in return to feed poison to the masses," he said.

Trashing the claims of GM food as safe food, Chopra said, "The company Monsanto which is promoting Bt Brinjal has a history of bad ethics. The company has been fined several times in developed countries because of its practices but the Indian government is willing to give a red carpet welcome."

Chopra, who has lived in Canada since 1960, had refused to approve various harmful drugs intended for meat and milk production. Due to his work, bovine growth hormone was banned in Canada in 1999 and in the European Union.

He has a literary streak as well and has authored books like "Corrupt to the Core" which details a full account of how government corruption endangers public food supply.

Umendra Dutt, heading Kheti Virasat Mission, which has been waging a war against GM foods, said, "There is a very strong nexus among politicians, bureaucrats and market forces which are allowing the release of Bt Brinjal."

A resolution was mooted on the occasion by PUTA president, Mandeep Singh, who called upon state governments of Punjab, Himachal Pradesh and Haryana to ban BT Brinjal.

Already governments of Kerala, Karnataka, Andhra Pradesh, Orissa, Bengal, Bihar, Madhya Pradesh and Chattisgarh have banned BT Brinjal due to serious health concerns.

Source: The Times of India

## Bharti-Walmart opens first agricultural co-operative centre in Punjab

Bharti-Walmart Pvt. Ltd, a joint venture between Bharti Enterprises and Walmart Stores Inc. for wholesale cash and carry and back-end supply chain management operations, has launched its first agricultural co-operative centre in Sirhind, Punjab.

The centre aims to build a robust aggregating, handling, packaging and delivering system of fresh produce to Best Price and Bharti Retail's easyday stores.

This initiative is part of Bharti-Walmart's direct farm programme in partnership with 100 small and marginal farmers near Ludhiana. The farmers will be paid for their produce within 24 hours post delivery. All legalities including APMC tax will be fully complied with, the company informed in a press release.

Speaking about the initiative, Raj Jain, MD and CEO, Bharti-Walmart said, "At Bharti Walmart, it is our constant endeavor to develop and work with local suppliers to develop an efficient and robust supply chain by reducing waste and ensuring qualitative, fresh produce for customers at easyday and Best Price Modern Wholesale stores. To meet these objectives, our associates, in partnership with Bayer CropScience will share best practices with small and marginal farmers to improve the quality and quantity of their yield."

For the company's first co-operative centre partner Bayer CropScience has also designed a scientific solution for the farmers through their "5P" process that underscores best practices in production, protection, programme monitoring, passport and post-harvest.

"Through these, Agriculture Centre will provide manifold benefits for farmers, including 7-10% higher price realization vis-à-vis open markets and additional incentives for better quality produce. The Centre will provide farmers with expert advice on crop planning and management, further strengthening Bharti Walmart's initiative to support farmers and small manufacturers who have limited infrastructure and distribution strength," the company added.

Source: www.fnbnews.com

## World-Class Research Centre Mooted

Agricultural scientist M S Swaminathan has said that a world-class research and training centre should be set up in Kuttanad for preserving and promoting the agricultural activities of Kuttanad and studying the impact of climate changes on the agricultural sector of Kuttanad.

He was speaking to newsmen after inaugurating a workshop on 'Healthy wetlands, sustainable development and climate change,' organised by the Kuttanad Vikasana Samiti (KVS), led by Fr Thomas Peelianickal, in association with the Environment Management Agency of Kerala and the State Pollution Control Board.

The centre will be set up this year under the M S Swaminathan Research Foundation (MSSSRF), and 10 to 15 acres of land will be identified for the centre, said foundation chairman M S Swaminathan.

Kuttanad is the only place of agriculture which is below the sea level in the country.

The farmers here have been contributing a major portion of paddy for the last 150 years and the farmers are applying their own techniques for the agricultural production.

So, one of the main purposes of the centre will be the preservation and promotion of such techniques scientifically and necessary steps should be taken for preserving Kuttanad as a globally important agricultural heritage site, he said.

The centre will give awareness to the farmers for meeting the challenges owing to the impact of global warming and climate change, he said. Answering a query, Swaminathan said that the present move of both the Centre and the State Government for executing the much awaited package are satisfactory.

Speaking to Express, Swaminathan said that the growth of tourism in Kuttanad was essential but it should be eco-friendly. "The tour operators should take necessary steps for avoiding pollution of the backwaters by houseboats and other boats in Kuttanad, he said.

Source: www.expressbuzz.com

## Bihar Seeks Ban on Casein, Milk Powder Export

In view of Union Agriculture Minister Mr. Sharad Pawar's remarks on milk shortage in North India, the Bihar State Government on Saturday appealed to the Centre to ban the exports of milk-based products, especially Casein, which accounts for nearly 80 per cent of the protein content in cow milk and cheese.

Speaking to newsmen, Deputy Chief Minister and State Finance Minister, Mr. Sushil Kumar Modi said, "the Centre must impose restrictions on the export of Casein, which was widely exported to international markets, and had a myriad uses in food products, medicines, plastic and paper. We also request that the export duty on Casein and milk powder be accordingly raised to check the dairy price rise."

Saying that the export of milk and milk-based products would result in price rise Mr. Modi added, "Bihar is at present supplying nearly One lakh litres of milk per day to Delhi, Orissa and West Bengal to tide over the dairy shortage."

Mr. Modi also said as cattle feed prices had dramatically shot up in the last few days, the Centre should wake up to the fact and accordingly stop the exports of cattle feed raw material as well.

Mr. Modi stated that the price of de-oiled rice husks had shot up from Rs. 3,125 per metric tonne in January 2009 to Rs. 5,625 per metric tonne in January 2010, while the per metric tonne cost of rice bran for the same period had soared from Rs.5,899 to Rs.8,825 per metric tonne.

Earlier on Friday, Chief Minister Nitish Kumar, while assuring that the State was not facing any shortage in the milk supply currently had said that "the State's popular milk brand 'Sudha,' and its regulating body, Bihar State Cooperative Milk Producers Federation (COMFED) had decided not to raise milk prices as of now.

"On our part, we are diligently following the Centre's directives to curb the skyrocketing prices of essential commodities," said Mr. Kumar, adding "Bihar had already done away with the process of levying 4per cent VAT on sugar prior to the Centre issuing that directive to the states."

Source: The Hindu (beta.thehindu.com)

## Biocon Chief Kiran Mazumdar Shaw Bats for Bt Brinjal

Bio-technology major, Biocon Ltd's chairman and managing director Kiran Mazumadar Shaw has extended her strong support for introduction of Bt Brinjal for commercial cultivation in the country as "biotechnology is a safe science and regulated technology.''

Addressing a news conference to announce the three-day Bangalore India Bio event, a Karnataka government initiative to be held from June 2 to 4, she said the introduction of Bt Brinjal must be viewed on a scientific basis and not governed by unfounded fears as it would lead to creating needless fear psychosis among the people.

The Bicon chief, who is regarded for her pioneering role in promoting biotechnology on a big scale in the country, said the mass hysteria sparked off by ill-informed people without proper understanding of the various issues was a matter of deep concern.

"We are one of the leading producers of Bt Cotton globally and I think farmers have benefited significantly from this technology,'' she said.

Biocon CMD said Bt is an optional technology and there is no compulsion for farmers to use this technology.

"The farmers stand to gain by using modern technology. Bt cotton has been a very clear case that farmers have really started increasing the cultivation as and when they found it to be useful and it's about discovering the use and benefit of this new technology,'' Mazumdar-Shaw added.

Source: www.daijiworld.com

# '3,000 farmer suicides in 8 years'

While Punjab remains, in popular perception, the land of plenty, a group of economists at Punjab Agriculture University (PAU) has revealed that the picture isn't rosy at all — in fact it's grim.

Rural indebtedness has touched Rs 35,000 crore and, worse, 3,000 debt-ridden farmers have committed suicide in the last eight years. Economists are also relating the suicides with high illiteracy among the poor farmers and say Punjab needs to increase expenditure on education.

"Rural debts are mounting rapidly and have touched Rs 35,000 crore in the year 2009-2010 as against Rs 21,640 crore in 2007," said Sukhpal Singh, senior PAU economist in Ludhiana. In the first such survey commissioned by the Punjab government, door-to-door survey of two districts indicated that nearly 3,000 farmers had killed themselves in the last eight years. "About 38% of these were 20 to 30 years old and 60% had unpaid debts. Significantly, 47% suicides were by illiterate," said Sukhpal Singh.

It's the small farm holdings, of two acres or less, which have made farming economically unviable and driven farmers who took debts to keep their crop alive to kill themselves. "A follow up at the homes of suicides have shown that nearly 25% of such families sold off their land after the death," said Sukhpal.

Inderjit Singh Jaijee, who launched Movement Against State Repression, blamed the government for keeping farmers' suicides under wraps. "Most of these suicides are unreported because suicide is a criminal offence and families avoid going to the police. This helps the state to go into denial about these tragic deaths at the grassroots," Jaijee said.

Linking the suicides to not just farm indebtedness but also to lack of education, R S Ghuman, professor and head of Economics, Punjabi University, said, "The state budget on education and its infrastructure is mere 11% and just 3.7% of children in Punjab are getting into professional education." Emphasizing on the need for better education infrastructure, Ghuman said, "The drop out rate in schools is unacceptably high at 60% until class X. This is making the farmers, especially those holding small farms, completely dependent on farming as a source of raising money to support their families.

Source: The Times of India

# AGRI TECH NEWS

## Bihar farmers return to school to learn new agricultural skills

In order to boost agricultural productivity in the state, the Bihar Government has launched an exclusive school for farmers to sharpen their agricultural skills.

The state government has launched 'Kisan Pathshala' (farmer school) - a programme that will teach farmers about modern technology to increase farm produce.

With diminishing land resources and ever-growing human consumption, this unique move is expected to sharpen the production skills of farmers.

Agricultural experts are teaching farmers the use of scientific techniques to increase their productivity on smaller plots of land.

As of now, there are over 3,000 farmer schools in operation within the state wherein the agricultural scientists are educating the farmers about the judicial use of soil, fertilizers, water, sowing and harvesting.

Farmers expressed happiness with the initiative, as it helped them to understand the balanced use of insecticides and pesticides.

"Earlier, I could not differentiate between friendly insects and the harmful pests. But after being taught about the same in the farm school, it has benefited me immensely. Initially, with the use of chemical fertilizers, I used to kill the useful soil insects along with the pests. But now I can differentiate," said Ram Singh Yadav, a farmer.

"The main objective of the government behind starting these schools is to teach the farmers the scientific methods of farming. The farmers here, in general, are involved in traditional agricultural practices. But in the school they are given practical training on how to sow the seeds, and the adequate amount of seeds to be used for a good yield," said Ganesh Ram, Agricultural Consultant, Patna.

Each school has about 25 farmers of both sexes learning various aspects of systematic and scientific farming.

Bihar is currently ranked third in the country in terms vegetable production and seventh in fruit production. This initiative aims at targeting over five lakh farmers who will be trained in these schools.

Source: ANI/news.oneindia.in

# UK - Wind power for all farms

That's the surprising claim made by wind expert Mark Newton as Farming Futures launches a free guide to wind energy for farmers, smallholders and land managers today.

With 75% of the UK's land in the agricultural sector, on-farm wind power can represent a significant business opportunity for farmers and land managers, as well as reducing greenhouse gas emissions, which contribute to climate change. The UK Government is committed to producing 15% of all our energy from renewable sources by 2020, and wind is expected to make a sizeable contribution towards that goal. As a result, financial incentives such as the new Feed-in Tariffs currently under consultation for April 2010 are making the business case for investment stack up for those with the right resources.

Mark Newton from Fisher German is one of the country's leading experts in wind energy. He says, "I believe that every farm in the UK will have a wind turbine in five years' time."

On-farm wind generation can range in size from small systems that power remote farm buildings, through to medium-sized turbines that power local buildings and sell to the Grid, up to multi-million-pound wind farm developments. Turbines must be well sited and have a consistent and adequate wind speed if they are to be a good investment.

This free Farming Futures guide outlines how you can assess your wind resource, what you need to consider when putting together a planning proposal, and where you can go for further sources of information and advice.

Madeleine Lewis from Farming Futures said, "Farmers with the right resources can do well out of renewable energy production. Producing energy on-farm can turn a profit, cushion you against rising oil and gas prices, and provide the UK with a secure, clean and renewable energy supply. It can also give access to new and better markets due to growing consumer interest in 'low-carbon' food." "In our 2009 survey, 50% of farmers said they were taking action to reduce greenhouse gas emissions from their farm, and we believe that on-farm energy generation could become the norm in the not-too-distant future."

Dr Jonathan Scurlock, the NFU's Chief Adviser on renewable energy and climate change said, "The NFU's aspiration is that every farmer should have the opportunity to be a net exporter of low-carbon energy. National targets and government incentives for renewable energy are creating significant new business opportunities

Source: newsroom - meattradenewsdaily.co.uk

# Government To Develop Policies & Framework To Facilitate Private Sector Investment In The Seed And Agro-industries: **National Seed Congress Inaugurated**

Rising temperatures in the next 15 years will lead to a huge drop in global farm production, anything between 20 and 40 percent, and the policy-makers are looking up to the breeders to find a solution to that.

Arguing that new plant varieties and high quality seeds have a critical role in providing a dynamic and sustainable agriculture, Agriculture Minister, Shri Sharad Pawar, called for all-out encouragement to this sector. He said the key to success in the farm sector is **seed security**: the availability of the appropriate variety at the right place and time, in sufficient quantity and quality

Inaugurating the National Seed Congress, the Minister said, 'Governments need to develop and maintain an enabling environment to encourage plant breeding and the production and distribution of high quality seed. Increased public and private investment in the seed sector is required for the long term if agriculture is to meet the challenges of food security.'

Shri Pawar emphasized that modern biotechnology and molecular breeding and associated methods for attaining increased production and productivity must be harnessed. Apart from genetic enhancement, other technologies related to quality seed production and quality enhancement techniques contribute substantially to improved seeds. Capacity building in all these areas has been supported by the Government and will continue to be a priority area. Simultaneously the establishment and maintenance of an appropriate infrastructure on the scientific as well as technical level is considered important, he said.

The Agriculture Minister also stressed on the role the private sector can play in seed production. He said: 'We need to recognize the benefits in developing complementarity and synergy between the two sectors. The Indian Sub-Continent and South East Asia are considered to have experienced a higher growth rate in agriculture mainly because of the good cooperation between the public and private sectors. Government is interested to develop appropriate policies and investment-friendly legal and regulatory framework to facilitate private sector investment in the seed and agro-industries.'

Seed exports, the Minister said, present a great potential. 'Global seed market has grown rapidly in recent years and is currently estimated at about 37 billion US dollars. India is ranked 6th with a market size of 1,300 million US dollars. The New Policy on Seed Development of 1988 has stimulated major growth in the industry as it attracted a lot of investment in seed business from seed companies. Given the growth of the seed sector in recent years, India has the potential to become the foremost player in the seed export business in the developing world with prospective markets in Asia, Africa and South America. But India's present share is less than 2% in the international market. I hope that with our enabling environment the seed trading export share will increase and we must look to achieve at least 10% share.'


**The Editor**
**Financing Agriculture**
**Agricultural Finance Corporation Ltd.**
**Dhanraj Mahal, 1st floor**
**Chhattrapati Shivaji Maharaj Marg**
**Mumbai 400 001**

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# India's Fertilizer Capacity to Expand

*Gas supply commitment is the lone hitch for new investors*

India's fertlizer industry is on a roll. Several fertilizer industry units have scripted plans to ramp up capacity. Six closed units of Hindustan Fertiliser Corporation Ltd and Fertiliser Corporation of India Ltd are on the revival path. Union Fertiliser minister M.K. Alagiri is active with a plan to get long-term commitment of gas supplies from Reliance Industries Ltd's Andhra offshore for these expansion plans.

Six firms have come forward to set up fertiliser plants besides ramping up their existing units. The total investment will be in the region of Rs 24,000 crore. All these companies are ready with technical and financial plans but the work on the projects cannot progress in the absence of firm commitment of gas supplies from a future date.

So the capacity expansion ultimately hinges on the firm commitment on fuel supply. The promoters of these projects are facing difficulty in extracting a firm commitment of fuel/feedstock supplies effective from a future date, to tie up funds for the projects. Without such a commitment from the government, the promoters cannot sign a bankable GSPA (gas sales & purchase agreement) and arrange funds from any lender.

The ministerial panel that was set up to distribute 40 million cubic metres per day (mcmd) of incremental gas for various industries arising from the Andhra offshore did not make any commitment on prior allocation of gas to any industry just to enable financial closure of investments.

In September 09, the ministerial panel allocated firm supplies to existing fertilizer companies at 17 mcmd.

## Balanced Application

Fertilizer demand in India will accelerate and there will be an increased focus on balanced fertilizer application. Says U.S. Awasthi, Managing Director of the Indian Farmers Fertiliser Co-operative Limited (IFFCO), "It is our firm belief that India's soil needs rejuvenation, along with soil management to cater to its micro nutrient and macro nutrient needs," IFFCO, formed in 1967 produced fertilizer for the cooperative sector in India.

IFFCO today produces more than 7 million tonnes of fertilizer annually and is tied up with 40,000 cooperative societies across India. The assets are worth more than US$10 billion. The manufacturing facilities are spread across the country along with a series of joint ventures and overseas investments. The government's restructuring of fertilizer subsidy regime is expected to enhance application of phosphate and potash-based fertilizers for boosting productivity. IFFCO is expanding its capacity to produce nitrogen-based urea fertilizer and has made investments in phosphate assets abroad to lock in supply.

## Phosphate Up

India's fertilizer subsidy more than doubled in the 2008-2009 fiscal year to more than US$25 billion with high raw material prices and tight nutrient supplies jacking up fertilizer costs. The sharp decline in Nitrogen and Phosphate fertilizer pricing has allowed the Indian government to slash the size of the subsidy this fiscal year. India secured major price cuts on its annual potash imports. Nitrogen, phosphate and potash are the three main macro nutrients in farming.

Over-application of nitrogen fertilizer and under-usage of phosphate and potash resulted from the skewed subsidy regime. In the future, demand for potash and phosphate will outpace the demand for nitrogen-based fertilizers. "If there is 3.2 percent average annual growth for other fertilizers, potash/phosphate demand is likely to grow around 4 percent on average," Awasthi said.

# HortiSeed Expo 2010 and National Conference on Production of Quality Seeds and Planting Material-Health Management in Horticulture Crops

Horticulture, which includes fruits, vegetables, tubers, ornbamental plants, medicinal and aromatic plants, spices, plantation crops has made rapid stride during the last two decades owing to technical inputs and incentives. However, availability of quality seeds and planting material, a basic to any technology led development, continue to be a limiting factor. Seed replacement rate is still very low. Indian Council of Agricultural Research, through the network of its research institutes has made significant contribution by way of developing technologies for propogation/seed production and also disease disgnostics which can facilitate the production and availability of quality seeds and planting materials. These technologies have been adopted in potato, citrus and banana bringing about a consciousness for quality planting material. One of the approaches adopted is in-vitro production of plants, which has been successfully adopted in production of Banana plants. For the development of horticulture in the right direction, adequate availability of quality planting material to the farmers is of utmost importance.

The government also encourages policies for ensuring availability of quality seed and planting material. To provide protection to the cultivators, PVP authority is also serving in the country. Advent of Biotechnical tools and transgenic have become a reality. A four day National Conference on Production of Quality Seeds and Planting Material-Health Management in Horticulture Crops is proposed. On this occasion, to showcase the technological advancement, an exhibition shall be organized.

## Exhibition:

A world class exhibition to be organized at National Agricultural Science Centre Complex, NASC located at the Pusa Campus, New Delhi, will offer an excellent platform for scientists, corporate and farming community to come together at this mega event to negotiate business deals and secure market linkages. The events will be visited by participants and large number of farmers of horticulture background. The exhibition will portray the technological strength of Indian horticulture from farm to fruit basket.

India- A land of abundant opportunities for Horticulture growers and Food Industry.

- Ranked among top five in horticulture produce.
- Availability of large inexpensive and disciplined labour force with the best IR track record.
- IIHR, NHM and NHB are working with prime thrust on promoting horticulture and utilization.
- Elaborate infrastructure, special economic zones, horti export zones, Food Park and wide range of R&D institutions.
- Special incentives for food processing in order to provide linkages between the farm produce and industry.
- Large untapped market and fast growing consumer base and is also the largest market for seeds, Fertilizers, farm Credits, farm machinery and consumer products.

## Profile:

**Indian Council of Agricultural Research, ICAR:** The Indian Council of Agricultural Research (ICAR) is an autonomous organization under the Department of Agricultural Research and Education, Ministry of Agriculture, Government of India. Formerly known as Imperial Council of Agricultural Research, it was established on 16 July, 1929 as a registered society under the Societies Registration Act, 1860 in pursuance of the report of the Royal Commission on Agriculture. The ICAR has its headquarters at New Delhi. The Council is the apex body for coordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country. With 97 ICAR institutes and 45 agricultural universities spread across the country this is one of the largest national agricultural systems in the world.

**Centre for Agriculture and Rural development, CARD:** Established in the year 2000 under the societies act 1860, CARD is a national level non-governmental organization, focusing on organizing, mobilizing communities and local as well as external resources for social, educational, environmental, technological and developmental interventions. CARD undertakes training, capacity building and technology exposure by organizing business and technical seminars, workshops and technology fairs. CARD monitors trends in agriculture and environment sector and advises Central and State Governments and various bodies on appropriate policies and actions for the development of agriculture, environment and the rural economy.

## Expected outcome of the event:

- Business and financial tie-ups, experts and official links, investment commitments and creation of future opportunities.
- Improvement in production of quality seeds and planting material for health management in horticultural crops.
- Improvement in technology, quality, value addition, marketing and export of horticulture produce.
- Awareness creation about the role of quality planting material in the health management of horticultural crops.
- Identification of potential market for export and device specific strategies to horticultural trade.
- Increase awareness about the quality seeds and planting material for horticultural crops.

## Exhibitor's Profile

- Seed and biotechnology
- Pesticides and PGR
- Fertilizers and micro nutrients
- Food processing
- Horticulture publications
- Horticulture research and extension
- Banks and Financial Sectors
- Rural Institutions and NGO
- Farm Machinery
- Agri/Horti Retail companies
- Horti inputs
- Educational Institutions

## State Government

- NHM and TMNE states would like to avail this opportunity to showcase there strength and major achivements made under the said scheme.

# HortiSeed Expo 2010

**11-14 March 2010,**
**NASC Complex, New Delhi**

*Coinciding with*

## National Conference

**on Production of Quality Seeds and Planting Material - Health Management in Horticulture Crops**




CO-ORGANIZER

भाकृअनुप ICAR

Indian Council of Agricultural Research, New Delhi

ORGANIZER

CARD

Centre for Agriculture and Rural Development

*For further details, contact*

**Siddharth Gautam,** (M) 0-9810585797
Event Secretariat: 502 Rohit House,
3 Tolstoy Road, New Delhi-110001
Ph. No. 011-23731128, 23731129, 46569160
Fax : 011-23731130 E-mail: siddharth@card.org.in
Website: www.card.org.in