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Issues and Ideas for Indian Agriculture

08 BT, indeed, the Better Cotton?

करो छिड़काव की शुरूआत, उलाला के साथ.

क्योंकि उलाला लम्बे समय तक नियंत्रण करता है (१५–२० दिन), ये ज़्यादा किफ़ायती है. उलाला कपास में माहू और तेलों का उत्कृष्ट नियंत्रण करता है. उलाला के इस अनोखे तरीके से काम करने के कारण किसी भी कीट में इसके विपरीत प्रतिरोधकता पैदा नहीं होती. इसलिए ये निओनीकोटीनॉइड (इमिडाक्लोप्रिड, थिआमेथाक्ज़ैम, आदि) का श्रेष्ठ विकल्प है.

भारत में पहली बार

उलाला

कीटनाशक

UPL GROUP OF COMPANIES

UPL United Phosphorus | ADVANTA Advanta India | Golden Seeds

ISK

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Fernando Weberich

Even the FARMER Needs a Choice

Indian indigenous knowledge provides its own signals in terms of interpreting and even predicting natural phenomenon. In their glorious ignorance, practitioners of modern science sometimes fail to notice these signals, leave alone interpret them. The Indian farmer, likewise, has a native intelligence, that policy makers oftentimes choose to overlook.

As I prepare my land to sow my guar crop under the sweltering June sun, on my tractor, I observe that the 'titudi' (red wattled lapwing) has laid its eggs on a "doli". The doli is a small embankment between fields to help watering by the flood irrigation method. This is significant because it is believed that a titudi lays its eggs on a raised platform when it senses a normal monsoon in the village. Otherwise it finds flat ground for this purpose. It never lays its eggs on trees. Significantly also, animal instinct is something even science recognizes.

Newspapers are already reporting uneven rains. The country being so large with monsoons patterns not yet fully understood one can never predict the actual outcome. The met office is cautiously seeking to unravel the monsoon mystery in a bid to predict correctly. Predictions, however, have to be made tehsil/taluk wise to be of any use to individual farmers and the met office needs to be a far more credible predictor than the titudi. Otherwise, it might as well post a flight of lapwings all over the country to predict the mind of the monsoon.

A refusal to understand and learn from farmer experience seems to have been the bane of Indian agriculture. The key findings of the study on the socio-impact assessment of Bt cotton, commissioned by the Bharat Krishak Samaj, clearly validate my personal experience and that of most farms on my radar. Hybrid Bt cotton farmers continue to be better off even as sceptics insist that Bt farmers are making considerable losses. They fail to acknowledge that more than 90 per cent of cotton farmers have been growing Bt cotton year after year for nearly 10 years now. The wisdom of 70 lakh cotton farmers should

LARGE GROUPS ARE SMARTER THAN AN ELITE FEW – NO MATTER HOW BRILLIANT – AT SOLVING PROBLEMS. THE WISDOM OF 70 LAKH COTTON FARMERS SHOULD AMOUNT TO MORE THAN THAT OF A FEW INDIVIDUALS

THE ONE THING THAT THE GOVERNMENT AGENCIES AND NON-GOVERNMENT ORGANIZATIONS HAVE IN COMMON IS THEIR ABILITY TO FUDGE DATA AND DISBURSE THEM AS FACTS, COURTESY WILLING NEWS CHANNELS

surely amount to more than that of a few individuals.

In the book, 'Wisdom of Crowds', New Yorker columnist, James Surowiecki, explores a deceptively simple idea: large groups of people are smarter than an elite few – no matter how brilliant – better at solving problems, fostering innovation, coming to wise decisions and even predicting the future. He offers a great introduction to applied behavioral economics by stating that a crowd's "collective intelligence" will produce better outcomes than that of a small group of experts.

Bt technology does not increase yield but only enables more cotton balls to mature per acre than before with reduced pesticide usage, to deliver a higher net yield and profit per acre. As a farmers' organization, one may not be adequately qualified to pass scientific judgment on the technology or its impact on the environment. One can, however, talk of actual experience without fear of being contradicted. In my village, the reduced use of pesticides has led to the return of the birds, bees and butterfly to the fields. Apart from better yield, farmers have also gained considerably from the increase in price of cotton over the years. It is government policy that actually determines farmer profitability more than anything else.

In the pages that follow, readers will come across as farmer who cultivates non-BT cotton. The underlying message is that BKS, as an organization, respects the right of the farmer to choose his crop. As an organization, BKS propagates prosperity for the farmer and holds his right to choose as paramount. Unfortunately, people and policy makers tend to disagree.

Abohar, the town from where I buy my agriculture inputs, had the dubious distinction of recording the second highest sales of pesticides in Asia. This phenomenon exterminated the entire muster of peacocks that had been around even when I was a teenager. In fact, there are more peacocks in Delhi today than in all of Punjab put together. The return of the vultures, last seen a decade ago, usually feasting on animal carcasses on village outskirts, is eagerly anticipated today. The one thing that the government agencies and the non-government organizations have in common is their ability to fudge data and disburse them as facts, courtesy willing news channels.

Photo: Sudip Dutta

wiadomski

There are other concerns around the Bt story though: the higher price for hybrid Bt cotton seeds that the Punjab farmers were officially going to be charged, for instance. The BKS' recent intervention, through the leader of the opposition in the Punjab Vidhan Sabha, Sunil Jakhar, led to compelling deliberations in the Assembly that forced the government to reduce the sanctioned maximum retail price of the packet. Farmers were consequently spared an expense of more than Rs 12 crores on account of cost of cotton seeds alone.

The point here is that the voice of the farmer needs to be respected. Even Abhijit Sen, member, Planning Commission, said that GM crops were here to stay. Jairam Ramesh has said that more farmers are growing Bt and that rational decision-making by farmers must be respected. Yet there are so many discordant voices that remind one of anthropologist Ruth Benedict's observation that "the trouble with life is not that there is no answer, it is that there are so many answers".

The sustained NGO action against GM technology in India also has a peculiar side effect. The same multinationals that these NGOs hate are being strengthened because, by opposing them, these NGOs prevent Indian talent from focusing on emerging technology. These companies have a head start on Indian research institutions and, at this rate, India will always remain dependent on them and forever play the catch up game. ●

Ajay Vir Jakhar
Editor

ABHIJIT SEN, MEMBER, PLANNING COMMISSION, ADMITS THAT GM CROPS ARE HERE TO STAY

To the Editor

Bouquets for a change?

Sir, I read every issue of your magazine thoroughly and while I appreciate your efforts at creating awareness, I find that you are critical of the government all the time. Does the government never do anything right? Do you never find anything good with any government policy? Constant criticism is sometimes counterproductive and while I do not wish to comment on your editorial policies, I feel you should look at the brighter side of things once in a while.

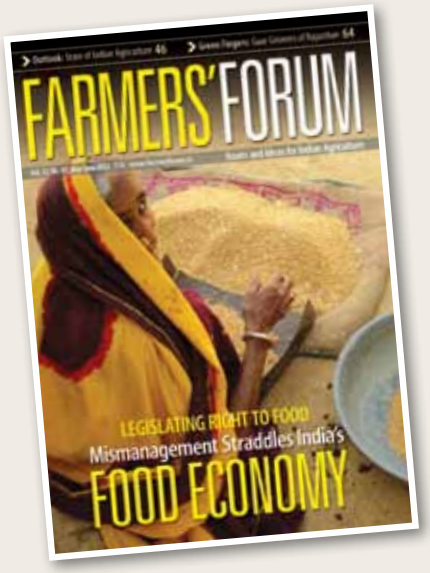
Meanwhile, keep up the good work.

Sonu Bharadwaj,
Bhopal, (Madhya Pradesh)

Farmer's ingenuity

Sir, I was delighted to read the article, "Food Security in the Indian Sundarbans" by Dr Asish Ghosh, ***(Farmers' Forum, May-June 2012)***. It makes me feel proud of the farming community that is indeed providing a "glimmer of hope in an environment of threat to food insecurity haunting the Indian countryside". It is wonderful to note that its painstaking efforts have led to the location of the lost salt-tolerant rice seeds that will help this extremely fragile ecosystem to adapt to climate change. In a country where celebrated government institutions disappoint, it is indeed India's fabulous farmer, working at the grassroots and his innovative ways, which will show us the way out.

Mihir Biswas,
Patharpratima, (West Bengal)



Apple economy sans ecology?

Sir, Ashim Choudhury's article, "Missing Bees Could Sting Himachal's Apple Economy" ***(Farmers' Forum, May-June, 2012)***, is very most interesting. It focusses on the importance of insects in the fields. Pesticides and chemicals have a dangerous effect on the environment. What will it take to convince both the apple grower and the administration that economies cannot survive at the cost of ecology?

Neha Marwar,
New Delhi

Farmers' Forum website www.farmersforum.in is now up and running. Log in to check out all earlier numbers.

Pathetic waste

Sir, Apropos of your cover story "Wasted Food; Hungry Nation" ***(Farmers' Forum, May-June, 2012)***, may I first commend you on an excellently put together report. What can one say about a country where farmers do their job by producing enough and more but the government does not know how to safely store the grain nor how to dispose it of in a manner that satisfies the needs of food security of the country, feeds the hungry and have enough to secure the country for the rainy day?

Your issue not only examines all aspects of food security but also discusses the problems in achieving it. The question is: is the government paying attention. Read with Alok Sinha's article, "Indian Imperative: Food Security for the Poor", in the same issue, which points out that of the 55 million tonnes of wheat and rice that the Food Corporation of India procures each year, at least 20 million tonnes remains un-released, one cannot but agree that even "a well- thought out conspiracy to harass the poor could not have been more effective", as the author says.

The worry is that the issue of food insecurity and rotting grains has been dealt with by the highest court of the country and by experts from various disciplines. Yet the government seems to be unable to stem the rot, literally. Does it not indicate that the government is not interested in safe storage of food?

Veena Mehta,
Meerut, (Uttar Pradesh)

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COVER STORY

COVER STORY

BT, INDEED, THE BETTER COTTON?

Photo: Fernando Weberich

Bt cotton is the first genetically modified crop to be used in India and cotton cultivation in the country is currently dominated by Bt cotton hybrids. These have been approved for commercial cultivation in 2002. Currently more than 90 per cent of the cotton area is under hybrid Bt cotton. While several studies have shown that farmers have benefitted from adopting the technology, others have expressed concerns about benefits over time.

The Council of Social Development was commissioned by the Bharat Krishak Samaj to assess the socio-economic impact of Bt cotton cultivation in various regions of India. The Farmers' Forum cover story focuses on the key findings of the study that has just been concluded.

Study objectives

1. To undertake a spatial and temporal analysis of world cotton production and trade.
2. To analyze trends in area, production, yields and farm input use of cotton in India.
3. To undertake a cost of cultivation and net return analysis of Bt cotton in different states.
4. To analyze the agronomic factors accounting for Bt cotton yields.
5. To analyze the effect of incomes of Bt cotton on the health and sanitation, education, infrastructure and other livelihood status of farmers across various farm.
6. To analyze the impact of Bt cotton on labour employment and income of landless labourers.

Methodology and data sources

A primary survey was conducted in selected districts of nine major cotton-growing states for the agricultural year 2010-11. The study is based on a total sample size of 1,050 farmers and 300 agricultural labourers across the country and is a cross-sectional analysis of farming population for a single year. Hence the information received has been compared with secondary data received from government sources.

Since it was difficult to compare a single year's study with previous years using the same population dataset, the research used farmers'

recall method during the interviews. Considerable information was also gathered on the basis of farmers' opinions on various issues. Secondary data sources include the Union Ministry of Agriculture, the Economic Survey, Government of India, the USDA, the Unctad and Faostat.

Commercial cultivation of Bt cotton in India was started in 2002-03 in the states of central and southern India. The northern region, comprising Punjab, Haryana and Rajasthan, began Bt cotton cultivation from 2005-06. This study, thus, considers the post-Bt cotton period for the central and southern states from 2002-03 and for the north from 2005-06 onwards. The key findings of the Bharat Krishak Samaj survey follow:

Pesticide use

Pesticide consumption in the country declined by 23 per cent in the post-Bt cotton period (2002 to 2009), compared to the pre-Bt cotton period (1996 to 2001). However, farmers reported that though – following the introduction of Bt cotton – bollworm damage had declined, there was increased damage caused by sucking pests, not supposed to be controlled by Bt cotton technology. The last two years have witnessed a drop in the rate of decline in pesticide consumption. Hence, the decline in cotton yields in recent years, can to some extent, be attributed to increased attacks by sucking pests.

Exports

India's share in the value of cotton exports increased from 0.75 per cent in the triennium ending (TE) 2000 to 10.53 per cent in TE 2009. Further, the quantitative growth of cotton exports in the pre-Bt cotton period (1990 to 2001) was 24.6 per cent. In value terms it was 21.3 per cent. Exports increased significantly to more than 75 per cent between the post-Bt cotton period (2002 to 2009). Thus, the advent of Bt cotton has changed India from a net importer into a net exporter of cotton.

Area under cotton: production and yield

Ever since cultivation of Bt cotton began in India in 2002-03, the growth rate of area under cotton and its production and yield between 2002 and 2011 increased by 4.91 per cent, 9.25 per cent and 4.95 per cent, respectively. This leap in growth rates, especially in the last decade, suggests the huge influence of Bt cotton on farming choices in India. However, the post-Bt cotton period also registered a marked increase in instability, measured through

Photo: Asif Akbar

the coefficient of variation. The average cotton yields also showed some decline since 2008-09, presumably under the impact of marginal lands (shallow soils in rain-fed areas) that were being brought under cotton cultivation, erratic weather conditions – especially rainfall – and increased attacks by sucking pests, not sufficiently controlled by the insecticides.

From 2009-10, the average area under cotton was the highest in Maharashtra (38 lakh hectares), Gujarat (27.6 lakh hectares) and Andhra Pradesh (17.07 lakh hectares). However, these states, especially Maharashtra, did not show commensurate increase in cotton productivity during the last three years because cotton was being grown on marginal lands. The highest average yield over the last three years was in Tamil Nadu (943.67 Kg/ha), where the average area under cotton was only 1.19 lakh hectares. Tamil Nadu was followed by Gujarat (659.33 kg/ha) and Andhra Pradesh (564.33 kg/ha), which showed relatively higher cotton area (more than 20 lakh hectares). These states were followed by Haryana (553 kg/ha), Punjab (538.67 kg/ha) and Rajasthan (506.33 kg/ha), where the area under cotton was around five lakh hectares.

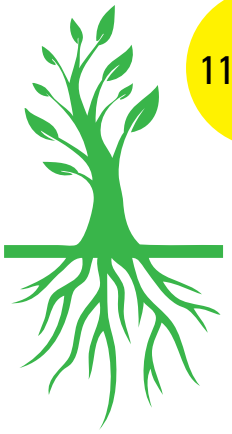
120 kg/ha in the post Bt-cotton period (2002-2008). The proportion of fertilizer cost to total cost also showed increasing trends in the post-Bt cotton period due to increase in fertilizer prices as well as increased purchasing power of farmers courtesy higher returns from Bt cotton.

Seed usage

Secondary sources say that the total seed usage of cotton declined from 9.23 kg/ha in the pre-Bt cotton period (1996-2001) to four kg/ha in the post Bt-cotton period (2007-2008). The field survey found that the average seed usage in Bt cotton was around two kg/ha. Despite relatively lower seed usage, farmers are realizing higher yields and hence higher net returns.

Seed sources

A high proportion of farmers (25.14 per cent) in the surveyed region used seeds of Nuziveedu Seeds Pvt Ltd, followed by Shriram Bioseeds Genetics (20.57 per cent), Rasi Seeds Pvt. Ltd (19.24 per cent), Ankur Seeds Pvt Ltd (17.24 per cent), Bayer Biosciences Pvt Ltd (14.95 per cent), Mahyco Ltd (13.62 per cent) and Monsanto Holdings Pvt. Ltd (6.29 per cent).



Overall cotton yields in India have declined due to increase in cotton area in marginal lands. ~~The total income or net returns from Bt cotton was much higher than income.~~

The yield in Maharashtra – with the largest cotton growing area – was the lowest (336 kg/ha). Madhya Pradesh had a cotton growing area of 6.53 lakh ha but the yield was just 437.33 Kg/ha. Some pockets in Maharashtra and Madhya Pradesh, for instance, are mainly rainfed with shallow soils and erratic rainfall patterns and can be termed as 'marginal land', compared to other traditionally cotton-growing areas in the states. Further, the yields in these states have also shown a decline despite larger areas under cotton. Hence, it can be safely said that overall cotton yields in India have declined due to increase in cotton area in marginal lands.

Fertilizer consumption

The per hectare fertilizer consumption increased especially after 2007-08. The average consumption of fertilizers increased from 95 kg/ha in the pre-Bt cotton period (1996-2001) to

Irrigation

The average irrigation costs per hectare increased from Rs 355/ha in the pre-Bt cotton period (1996-2001) to Rs 813/ha in the post-Bt cotton period (2002-2008), in response to increased diesel costs. However, the proportion of irrigation costs to total costs showed declining trends in the post-Bt cotton period.

Labour

The proportion of human labour cost to total cost of cotton was the highest in the for the cotton crop over the years. It ranged between 25 per cent and 50 per cent in various states. The human labour use increased positively from 96 man-days/ha in the pre-Bt cotton period (1996-2001) to104 man-days/ha in the post-Bt cotton period (2002-2008) mostly for the harvesting activities on account of higher yield. The average daily wages of landless labourers increased by more than 80 per cent from

the pre-Bt cotton to the post-Bt cotton period for all kinds of farm operations in all the surveyed regions. The percentage increase in female labour wages was around 10 times more than for their male counterparts. At the all-India level, labour wages were highest for post-harvesting operations, followed by picking.

Machine labour

The average per hectare costs of machine labour increased from Rs 732.06/ha in the pre-Bt cotton period (1996-2001) to Rs 1,408.07/Ha in the post-Bt cotton period (2002-2008). Growth rates of machine labour costs showed substantial increase in the post-Bt cotton period in the major cultivating states. The cost of machine labour as a proportion of total costs showed increasing trends in the post-Bt cotton period.

Demographics

Most Bt cotton growers surveyed across the country were small farmers (53.71 per cent) followed by medium (36.76 per cent) and large farmers (9.52 per cent). Further, all farmers (100 per cent) surveyed in the major cotton-growing states cultivated Bt cotton. Farmers mainly learnt of Bt cotton from fellow farmers (72 per cent) followed by seed dealers (22 per cent), extension workers (three per cent) and social media (three per cent).

The total hybrid Bt-cotton area as a proportion of total cotton area was over 90 per cent. The all India average yields of hybrid Bt cotton were reportedly slightly higher than those of non-Bt (desi) cotton. Bt cotton area and yields were scale neutral.

Cost of cultivation versus income

The average minimum support prices (MSP) of cotton increased from Rs 1,363/quintal in the pre-Bt cotton period (1992-2001) to Rs 2,242.50/qtl in the post-Bt cotton period (2002-2011). The farm harvest prices (FHP) of cotton also increased across all states in the post-Bt cotton period. However, both the MSP and FHP showed high fluctuations, indicating instability in cotton prices over the years in all states. Further, the MSP of long staple length cotton in the country in 2010-11 was Rs 3,000/qtl. The field survey showed that farmers in all the states sold cotton above the MSP, the all-India average being Rs 4,377.43/qtl. The ensuing net returns per hectare, derived from the cost of cultivation analysis (total working capital) of cotton was positive in all the regions, indicating good profits to farmers from cultivation of Bt cotton.

The average net return from Bt cotton at the all India level was Rs 65,307.82/ha. The per hectare net return was scale neutral across farm size classes. Further, the total income or net returns from Bt cotton was much higher than income from other non-farm sources. Data from the Ministry of Agriculture showed that the average per hectare cost of cultivation increased by 67.68 per cent in the post-Bt cotton period (2002-2009) from the pre-Bt cotton period (1996-2001).

The field survey revealed that high costs in Bt cotton were mainly due to human labour (52.69 per cent of total cost) for planting, weeding and harvesting followed by cost of fertilizers (10.84 per cent), seed (9.61 per cent) and mechanization (8.86 per cent). Secondary data on per hectare value of production also showed a 94.06 per cent increase in the post-Bt cotton period from the pre-Bt cotton period. The average net return per hectare also increased significantly from the pre to the post-Bt cotton period by 375 per cent. This change was much greater than the increased costs of Bt cotton cultivation. The percentage change in value of production and net returns per hectare from the pre-Bt cotton to the post-Bt cotton period was high enough to offset the increase in per hectare cost of cultivation of Bt cotton in the major cultivating states. This showed that despite high cost of cultivation. farmers were deriving greater benefits from Bt cotton cultivation.

The total income or net returns from Bt cotton was much higher than income from other non-farm sources. The total income or net returns from Bt cotton was much higher tha

Farmer suicides

Between one per cent and four per cent of farmers in states like Maharashtra and Andhra Pradesh were reported to have committed suicides. Farmers in the central Indian region blamed the suicides

Photo: Jack Arrington

mainly on low and erratic nature of rainfall as this was a rain-fed region, unavailability of timely credit and fluctuating cotton prices over the years that made production risky in certain years. As timely availability of institutional credit was a challenge, farmers depended more on non-institutional sources of credit such as money lenders, arhatiyas (middle men), relatives and friends. Non-institutional credit was easily accessible but had a higher rate of interest.

Farmer perception

As much as 94 per cent farmers said that Bt cotton yields were higher than non-Bt cotton and 87 per cent said that returns were also higher. Also, 84 per cent of the farmers said that the quantity of seed usage per hectare on Bt cotton was less than that used in non-Bt cotton. However, 92 per cent farmers said that the expenditure on Bt cotton seeds was more than that on non-Bt cotton.

Only two per cent of the farmers – a very small proportion – faced problems of spurious seeds. All proportions were very similar across all the surveyed districts and across different farm size categories and 84 per cent farmers said they did not plant 'refuge crops' alongside their Bt cotton plots. This was because farmers looked at getting higher yields and earning higher income by maximizing area under the Bt cotton crop.

The fertilizer usage on Bt cotton was reported to be slightly higher (54 per cent) than non-Bt cotton (46 per cent). At the all-India level, 76 per cent farmers reported that the pesticide usage on Bt cotton had fallen over the years and 71 per cent said that the expenditure on pesticide use for Bt cotton was also lower.

As much as 90 per cent farmers agreed that Bt cotton had reduced bollworm attacks. However, as far as irrigation expenditure was concerned, a relatively higher proportion of farmers (59 per cent) said that irrigation expenditure on Bt cotton was higher than on non-Bt cotton.

Socio economic impact

The field survey also documented the effect of increased returns from Bt cotton on the livelihood status of farmers and landless labourers. On an average, 85 per cent farmers and landless labourers invested in better quality education for their children, 77 per cent reported intake of high value and nutritious food, 70 per cent in recreation and social functions, 75 per cent on the health of their family members and 64 per cent on health of livestock. ●

COVER STORY

Gurdeep: back to non-Bt cotton

Photo:

Not Cottoned On

Travails of a Smallholder Cotton Farmer

Ajay Jakhar

There is haze of sand all around in this mid-summer day. The grain of the sand is much smaller though. It has grown tiny over the years even as the intensity of the sand storms has dropped. Vast tracts of land have been brought under cultivation and irrigation since Independence, disallowing the natural forces their full play.

Meet a present generation farmer, Gurdeep Singh. He is amongst those responsible for the productivity gains under the Green Revolution. He has been doing mono culture crop rotation between wheat and cotton since his childhood. The cotton varieties have changed from LLS to J 34 and now Bhiyani 61. Earlier, the cotton yields were smaller but Gurdeep only used half of the 50 kg urea bag. Today, he must apply two bags of urea and one bag of DAP to get a slightly higher yield. Gurdeep does realize that all this is denuding the soil of its natural properties.

Apart from the worsening climate, he blames excess application of chemicals for the destruction of the soil. He recalls that his forefathers would leave the land fallow for one season every year to make for soil regeneration. In these trying times, he is unable to make ends meet and, therefore, has no option but to plant two crops a year. He cannot afford to give his land time to rejuvenate itself or to "rest", as he calls it.

Gurdeep Singh is 50 years old and one of his parents' five children. He, therefore, inherited his share of two acres of the 10-acre land paternal land. Gurdeep is not educated but has tried to give his children an education. He has three: Binder who has studied up to Class 2; Jagga who has passed Class 12 and Zora who has passed Class 8. The two elder children were compelled to quit school to help on the farm. The youngest decided that the school education would not empower him to make his ends meet and opted to train to be an electrician in the village.

These are the sorry consequences of smallholder farming. There can be no meeting of ends without supplementing income from other sources. Therein lies the crux of the challenge of increasing job opportunities, which are not directly dependent on the farm, in the villages itself. Something that the government has not pursued seriously.

Gurdeep can be termed a small farmer as per Indian categorization and is a part of the 60 per cent majority of Indian farmers. He has suffered because of fragmented land holdings but is lucky

to have access to canal water, unlike the rest of the 60 per cent of rain fed India. There is no tube well water though. The underground water is brackish. The brick (pucca)-lined canal (khala) was built 30 years ago and has not been repaired since. This has affected the regular supply of water to the field. While the hours of water supply (bari) remain the same, the supplies that earlier watered three acres now water only 2.25 acres.

One gets 15 minutes of water once a week for every acre of land owned. The efficiency of supply has dropped courtesy the poorly maintained infrastructure. The only dispute Gurdeep is embroiled in is over the supply of canal water. Apart from having to interact with the officials for his water dispute, he has never had to meet any government officer like a patwari or a tehsildar.

Gurdeep grew Hybrid Bt cotton only once, two years ago but gave up on it because it required more water even though his cost of pesticide went down by between Rs 3,000 and Rs 4,000. Inconsistent water supply was the most problematic factor making him opt out of Bt Cotton. He could not afford to multiply his risks manifold.

Gurdeep reminds one of the plight of the Vidharba farmer. There is no difference in selling price of the two crops though. Last year he sold cotton at a rate of Rs 4,900 per quintal and this year he got less, Rs 4,200 a quintal. There lies another tale of woe. Gurdeep takes his crop to the arthiya (commission agent), who charges Rs 2.50 per Rs 100 as commission for sale of the produce. The same commission agent becomes the moneylender lending to the farmer at an annual interest of two per cent. When the farmer sells his produce at his shop, the agent deducts his loan, interest and commission before paying the farmer his balance, if any, for that season. That is the problem of agriculture credit not being available for the smallholder farmer.

Matters gets worse because when the farmer wants to buy pesticide or fertilizer the same agent sends him to a shopkeeper, who advises the farmer on what to use. That is another bane of the small farmer, who has no source of competent advice and is left at the mercy of the moneylender and the shopkeeper for both money and advice. This combination is frightening under any circumstance. No agriculture officer has ever visited Gurdeep's family to offer advice, thanks to the collapsed extension services in this country. His soil has never been tested. The government machinery is just not present. This absence compounds the problem; if government policies have not been responsible for creating the problem in the first place.

Asked what he expects of the government, Gurdeep shrugs: better quality inputs and, hopefully, better prices. The government cannot do much, he believes, as he is fast losing hope in the official machinery. He does not realize that it is the government, which is responsible for much of his miseries.

Gurdeep owns two buffaloes and two cows. Earlier he owned and loved his camel. When it dies of old age, the family did not buy a new one because, being a very big animal, the camel consumed a great deal of fodder that is very expensive now. Gurdeep grows his fodder of barsim and jawar as he has been doing since he started managing the farm work.

He is the lucky and sensible in not owning a tractor. Owning machinery spells economic folly for small farmers, who do not need to use equipment on the farm for more than 15 days in a year. Owning any farm machinery is like tightening the nooses around the small farmer's neck. The only option is for the government to actually create jobs for the non-land owning youth by incentivizing them to buy machinery that they could lease out to the land-owning classes. This is the remedy that would not only create jobs in the villages but also give the farmers the use of machinery without having to invest in it. Such simple logic eludes the officers who decide the farmer's fate. Surely, the system of preparing officers for the administrative services needs to be reviewed to ensure that India's real grassroots needs are understood and addressed for the country's sustained growth and prosperity.

Gurdeep is happy that the supply of electricity has improved though it is more expensive now and there is greater usage at home. Also, the villages

Gurdeep grew Hybrid Bt. cotton only once, a couple of years back. He gave up on it because it required more water that was an uncertain proposition in his village

Photo:

Jagga: more money in vegetables

Gurdeep rues the panchayat/sarpanch elections that have bred disharmony in the villages; the elected and the aspiring instigate villagers against each other for electoral gains

are definitely cleaner than before. What he rues are the panchayat/sarpanch elections that have bred disharmony in the villages. Those elected and those aspiring are always instigating everyone against each other to win the next election. These are the social consequences of the much-hailed empowerment of the countryside. Gurdeep believes that such divisive debates would cease if there were no village-level elections.

Has he ever heard of a heard of solar cooker? The answer is a no. Gurdeep asks if it runs on gas or what. So much for the renewable energy initiatives of the government that so desperately seeks to achieve its solar power capacity installation targets. No one focuses on more the critical efforts to improve the lives of the least important denominator in the populace, which is how policy should be prioritized.

The poorly educated peasant's son is far better tuned to reality though. Gurdeep's son, Jagga, has started vegetable farming simply on the word-of-mouth testimony of fellow farmers. He realizes that it is much more profitable than cotton farming. He grows ghiya on half an acre of land and sells it for Rs 35,000 while the cotton would sell for Rs 15,000. He needs more water to grow more vegetables. He needs a water storage tank and drip irrigation system. The latter is taken care of by Jain Irrigation that does a wonderful job but then he needs an electricity connection and to pay for the power.

If the weather gods are kind and the vegetable harvest is good, Jagga will have to worry about the marketing bottlenecks in the country. There are the truck unions with political patronage who fleece farmers by charging higher rates for transporting the produce. Yet another sour point.

Farmer Jagga has inherited another minefield of worries in a land where the farmer's is supposedly the hand that feeds the billion plus mouths. ●

India's cotton farmers' lives transform for the better

Research indicated that 87 per cent of Bt cotton farmers enjoyed higher standards of living, 72 per cent invested in their children's education and life insurance, and 67 per cent repaid their long pending debts*. Many more built *pucca* (stone) homes, purchased farm equipment and motorcycles, leased additional land for cultivation etc. Further, women from Bt cotton households had higher access to maternal care services, while children had higher levels of immunization and school enrolment*. Additionally, female earners witnessed a 55 per cent gain in average income, and 42.4 cr. additional days of employment across the total Bt cotton area**.

Partnering India's cotton revolution - Mahyco-Monsanto Biotech (MMB).

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*IMRB Samiksha 2007 ** Nature

• Bollgard® and Bollgard II® in-the-seed trait technologies provide cotton plants in-built insect protection against bollworms infestation leading to lower insecticide use, better boll retention, and higher yields. • Bt cotton is widely planted around the world as an environmentally friendly way of controlling bollworms, which are known to cause maximum yield loss and economic damage to the cotton crop. • **Mahyco-Monsanto Biotech India Ltd. (MMB), a joint venture between Maharashtra Hybrid Seeds Co. Ltd. (Mahyco) and Monsanto Holdings Pvt. Ltd. (MHPL)** has broadly licensed in-the-seed cotton trait technologies to several Indian companies so farmers can access technologies in the preferred hybrid seeds of their choice. • Bollgard II and Bollgard logo designs are registered trademarks and under the license from Monsanto Company. For information/career opportunities, contact www.mahyco.com or www.monsanto.com.

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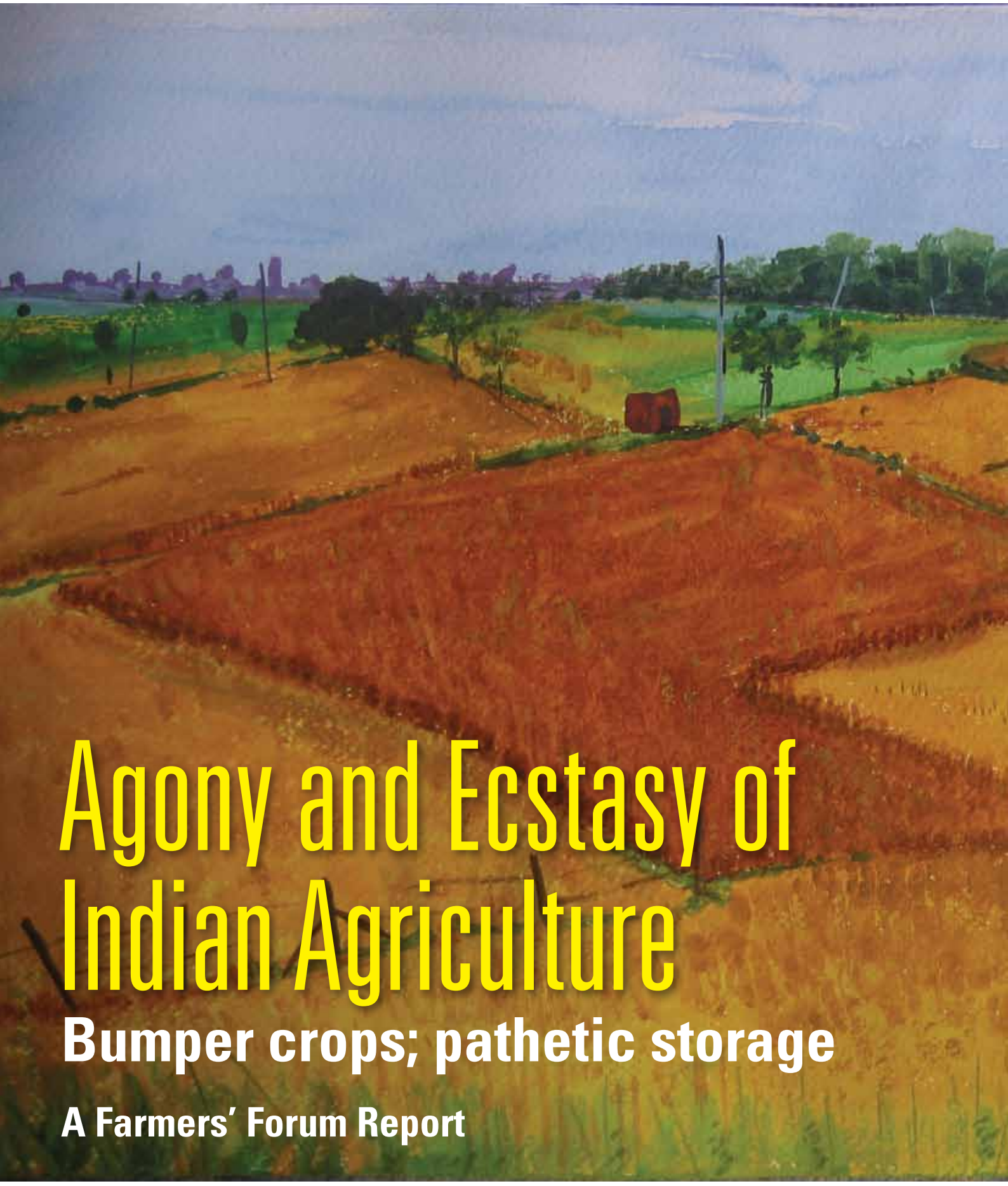


Agony and Ecstasy of Indian Agriculture

Bumper crops; pathetic storage

A Farmers' Forum Report

Painting: Ashim Choudhury

Amidst the overwhelming tragedy around Indian agriculture – with farm deaths, wasted grain, malnutrition and gross mismanagement of the farming sector – is the one shining accomplishment of the country seeking to secure food for all through a legislation based on its domestic production. India has come a long way from those enormously troubled "ship-to-mouth" days of 1965-66, when food had to be imported to feed the country. There is also hope in modern processing and technology that – should the government have the will – can help the farmer emerge from his current state of hopelessness amidst shrinking profits and soaring costs.

Farmers' Forum organized a conference on "Food Security: Challenges for the Indian Farmer" under the aegis of the Bharat Krishak Samaj, in New Delhi, on May 24, 2012 with an eminent group of experts examining the issues from different perspectives. The panelists, moderated by Paranjoy Guha Thakurta, included: M. S. Swaminathan, noted agricultural scientist/ Member of Parliament, who delivered the keynote address; Chandrasekhar Sahu, Minister for Agriculture, Animal Husbandry, Fisheries and Labour, Chhattisgarh; T. Nanda Kumar, former Secretary to the Government of India, Department of Agriculture and Co-operation, T. Haque, former Chairman, Commission on Agricultural Costs and Prices, Government of India; Alok Sinha, former Chairman, Food Corporation of India; Biraj Patnaik, Principal Adviser, Office of the Commissioners to the Supreme Court in the Right to Food Case; P. V. Satheesh, Convenor, Millet Network of India and Director, Deccan Development Society; N. K. Singh, Member of Parliament and Deputy Chairman, Bihar State Planning Board; Sushil Nagpal, Executive Director, Food Corporation of India; Tushar Pandey, President, Strategic Initiatives, Government & Advisory, Yes Bank; Vaishali Chopra, Senior Manager, Rabo Bank; and Manas Ranjan, Programme Manager, Action Aid.

Food security: a matter of availability, affordability and absorption

M. S. SWAMINATHAN
Agricultural Scientist and Member of Parliament

The problem of food security is a complex one being a combination of food and non-food factors. It has three basic conponents: the availability of food in the market (production), access to food (capacity to buy it) and absorption of food in the body, which depends on non-food factors like sanitation, drinking water, primary health care, environmental hygiene, immunization and such others. The Food Insecurity Atlas of India, produced by the World Food Programme, shows that there are many states with a good enough social protection system like Tamil Nadu, where the public distribtion system (PDS) is universal and almost 18 million families get free rice. Even so, Tamil Nadu has instances of child malnutrition. This is because such other requirements of food security as the non-food factors have not been taken into account.

Consider the first component of food security: the availability of food in India. This has been particulary good this year because of the favourable weather. What are the danger areas? Wheat yield in India is a gamble in temperature, which is why climate change will pose a problem. This time, Punjab alone produced four times the wheat that the country produced in 1947. It produced 24 million tons, of which 13 million tons was contributed to the public distribution system (PDS). Even Haryana and Madhya Pradesh did exceedingly well with wheat and rice production too was more than 100 million tons. Food availability is then not the real problem.

Much of this food adequacy has been achieved by land-saving agriculture, also called the Green Revolution, which essentially means productivity improvement in the same area. For instance, the 90 million tons of wheat produced this year, at the average yield level of 1965-66 (which was 800 kgs per hectare) would have required 90 million hectares but that quantity was produced in less than 30 million hectares. This is why green revolution became essential in countries with small land holdings and where demand for land for other purposes has been high. The good news is that there is a lot of grain this year; the bad news is that the farmer is unhappy. Last month, I went to mandis where wheat was being ofloaded and stored pitiably. So, on one hand, there is the ecstacy around the harvest plenty but, on the other, agony of bad handling and storage.

Almost 90 per cent of the farmers from Punjab said that they had to take loans to grow wheat because of inadequate income and high input costs: higher fuel prices, ground water depletion because of overdrawing, no corresponding recharge, excessive use of fertilizers and such others. This points towards short-term economic problems and long-term environmental ones that will afflict farming in the times to come. This is why the National Farmers' Commission recommended a National Policy for Farmers that was put up in the Parliament in 2007. It calls for a reorientation of India's farm strategy that currrently views the state of the farmer in terms of crop production and growth rate but not his real income growth.

A two-pronged strategy was proposed: a low interest rate of seven per cent and a minimum support price that says that the farmer should be paid 50 per cent over and above the selling price of his grain. The loan scheme is almost through but the issue of support price is not settled. The point is that thrre can be no complacence with a good crop production that is of no help to the famrers. Farmers in Andhra had declared a crop holiday last year because of the overstocked rice positions in

the mills that refused to buy anymore.

Farming in India is also afflicted by shrinking land holdings, indebtedness, loss of interest from the youth and feminization of agriculture. I introduced a private members' bill: Women Farmers' and Entitlements Bill to address gender specific needs. The Punjab Agricultural University has many girl students, which means that the impression that men are mainly engaged in farming is wrong. There is also a serious mismatch between production and post-harvest technologies not only around grains but fruits and vegetables as well. Post-harvest technologies have not caught up, leading to spoilage of food. Such technologies are slowly emerging and India is able to save up to 25 per cent of the losses even as the agriculture minister informs the nation that it is saving up to the third decimal point. One wonders how credible that estimation is.

There is, besides, the need to attend to the problem of 60 per cent of Indian farmland being rainfed. Pulse production, mainly in the rainfed areas, should increase quickly if a remunerative support price strategy is adopted, as is for wheat and rice. Only a good price will not be enough though. The government needs to lift the pulses. Many Punjab farmers complain that this is not happening at the scale of cereals. This is why handsome crops do not translate into happy farmers.

On the brighter side of agriculture in India is the fact that the country still has large untapped yield reservoirs unlike China where the land potential has been exhausted. Also, India has more uptapped opportunities for technological upgradation. Thanks to the MNREGA (Mahatma Gandhi National Rural Employment Guarantee Act), time saving mechanization is taking place but problems like burning of straw in Punjab still pose the challenge in terms of soil micronutrients being killed. There is need for mechanical processes to reuse this straw and use it in the field to obviate burning.

The second aspect of food security is economic access to food, which is what the food security Bill

The National Farmers' Commission recommended a National Policy for Farmers that was put up in the Parliament in 2007. It calls for a reorientation of India's farm strategy

addresses: its legal components cannot address food production but only the entitlements: how much is a person entitled to. For the first time, the concept of food basket has been enlarged in the Bill to include nutri-cereals besides wheat and rice. Known as coarse grains earlier, ragi, jowar and bajra constitute an important part of a healthy diet. In China, in fact, the total production of 500 million tons follows the one third concept: one third of the production is wheat, one third is rice and the rest is coarse grains. These cereals are important for animals as well. Poultry, for instance, which is fast growing, requires maize.

For social protection also, the Bill has certain provisions like the lifecycle and the gender approach. All life stages from an old and infirm person to a child have been covered. Women are to be considered the head of the family when it comes to entitlement and ration cards because the woman plays a crucial role in managing household food security. For the past 50 years, there have been a host of social protection schemes like the ICDS, noon meal programme, food for work and the NREGA now but the malnutrition figures have refused to budge. Even if the overall percentage shows a decline or an increase in case of food production, the per capita availability of food, food for every person in the country is very low.

Farmers are not the beneficiaries of government schemes but every Indian is the beneficiary of what they produce. The farmers safeguard the country from hunger

The Prime Minister's Nutrition Advisory Council has identified 200 high-burden districts that are mainly tribal areas or naxal-affected. The current budget will fund special efforts to counter the problem of malnutrition in these districts. However, one has to appreciate that for the first time in the history of this country, India is thinking of a right to food legislation with home grown food, which is a great transition from the "ship-to-mouth" days of 1965-66, when food had to be imported to feed the country.

The third aspect of food security is the absorption of food in the body. The body requires not just energy, protiens and fats but also such micro-nutrients as Vitamin A and B12, folic acid, zinc, iron and iodine. Many suffer from deficiency of these micro-nutrients that can appropriately be categorized as "hidden hunger". The Bill does not address this problem. Nevertheless, it can be a great tool to optimize both the production as well as the distribution side because this will mean prompt payment to the farmers from whom the grain is procured.

The Bill also includes many reforms in the PDS, including determining the high-priority or low priority population, which began in 1997 under the targetted public distribution system. That system was more to prevent leakages and corruption but that should not be the purpose of the food security Bill. States with universal PDS like Tamil Nadu and Kerala have a fairly good experience in this area and it is strongly recommended that at least the 200 high burden districts should have universal PDS even if it is not possible for the entire country to have it so that one can actually measure the success of the provisions of the Bill.

The Bill should have four main segments:

- Legal entitlements
- Enabling provisions like drinking water supply
- Sanitation and primary health care and micronutrients like folic acid and iron supply to pregnant women or the availablity of iodine and iron fortified salt for absorption of food
- Infrastructure for storage and post-harvest processing, which is very poor today and the governance of the delivery system.

The National Farmers' Commission suggested a National Food Security Council to the Prime Minister, which is headed by officials. However, the food security Bill, which is the largest social protection measure against hunger in the world, cannot be implemented without a pan-political support. So some chief ministers from the surplus as well as deficit states should be members of the council and should be charged with monitoring the implementation. Even gram panchayats and local bodies should be included in this council because they are the ones who can identify the abuse and misuse of the law in this case.

Another institutional mechanism required by this Bill is the National Grain Post-harvest Management Board, comprising all the stake-holders, including the Food Corporation of India, the food ministry, the Jute Board (to ensure adequate delivery of

gunny bags), the surface transport ministry and such others to manage post-harvest activities. It has to be realized that farmers are not the beneficiaries of government schemes but every Indian is the beneficiary of what they produce.

The farmers safeguard the country from hunger. The attitude towards farmers and farming has to change accordingly and farming as a sector must be invested with more social prestige. Otherwise the younger generation will not enter farming. The concept of nutrition too has to be mainstreamed in all programmes. For instance, the horticulture mission should focus on remedying all kinds of deficiencies rather than focussing on exports. Otherwise, the problem of malnutrition will remain despite availablity of food in the country.

Paddy and poverty need not go together

CHANDRASEKHAR SAHU
Minister for Agriculture, Animal Husbandry, Fisheries and Labour, Chhattisgarh

The National Farmers' Commission's report, submitted to the central government in 2007, has not even been discussed in Parliament. One had pinned a lot of hope on that report and if the Indian Parliament is serious about doing something about farmers and acknowledging their contribution to the Indian economy, they should consider this report. An important recommendation of the Commission was that agriculture be put on the concurrent list. As of now, it is a state subject but all the subsidies, schemes and programmers related to farming are decided by the central government. However, there has never been a discussion in Parliament about shifting it to the concurrent list.

Chhattisgarh is virtually a monocrop area, producting mainly rice. One has been told that paddy and poverty go together and if that were true, Chhattisgarh would have remained poor for ever. Thanks to the green revolution, over the past 12 years, one has seen a 10-fold increase in paddy production. The Prime Minister awarded the Chhattisgarh the chief minister last July for the rise in the state's paddy production. The accomplishment provided hope that a farmer can not only become self-reliant but also make agriculture a profit-making business provided he gets an adequate price under the minimum support price (MSP) regime. This makes the recommendations of the Farmers' Commission very important.

Chhattisgarh's tribal belt produced a lot of minor millets like Kodo, Kutki, Sawa, Ragi, Ramtilla, Kulthi and such others. Kodo is one crop that can survive for 50 years in any kind of environment. During the Bengal famine, most people in tribal areas of Chhattisgarh, Andhra and Odisha survived on Kodo. However, the tribals do not get any MSP for these minor millets and nor is any effort being made for their fortification. The state government is trying to help but that is not enough. As a result, the farmer does not want to grow unremunerative food crops only but wants to move to cash crops to increase his earnings.

Agriculture in India has endless possibilities. Around 60 lakh metric tons of paddy was procured in Chattisgarh this year at its 1,888 paddy

Thanks to the green revolution, over the past 12 years, one has seen a 10-fold increase in paddy production in Chhattisgarh

procurement centres and Rs 6,400 crores were deposited directly into farmers' accounts. This effort by the state government to maintain the MSP is expected to revive the farmer's interest in farming but it is not enough. The cost of production of paddy in Chhattisgarh is Rs 1,680 per quintal but increasing petrol prices and withdrawal of subsidies on fertilizers like DAP are making production difficult for the farmer.

Since the formation of Chattisgarh, the seed replacement rate has increased from four per cent to 25 per cent and the number of farmers with tractors has gone up from 8,000 to 42,000. The government provides rice at Re 1/kg to people but pays the farmer Rs 12. By the seventh of every month, every Antyodaya Anna Yojana family gets 35 kgs of rice at Re 1/ kg and the others at Rs 2/kg from the state's fair price shops that are run by co-operatives. Chhattisgarh co-operatives take a loss of Rs 400 crore annually in purchasing paddy. Will the central government help overcome this loss and also make the MSP remunerative. This is possible if farmers' organizations unite together on this issue.

Food security: a holistic approach

T. NANDAKUMAR
Former Union Secretary, Department of Agriculture and Co-operation

The figures relating to India's hungry and undernourished in the International Food Policy Research Institute's (IFPRI) hunger report by are quite unpalatable. The institute has measured hunger on three parametres: underweight people on the basis of BMI, underweight children and child mortality under the age of five. There are other criteria to arrive at the number of undernourished people, which include indicators like water and sanitation. The main objective of the food security Act is to reduce this number significantly. The first question that one must ask is whether the food security Act is sufficient in its present shape. If not, what needs to be done? The second question is: does this Act empower agriculture in any manner.

The main issue around ensuring national food security is to produce enough. India is producing enough of wheat and rice but the concern for nutrition security has meant that it is importing a lot of pulses and oilseeds at a huge cost. The other concern is how much grain should be procured for public purpose and how much should go into private trade. There is a co-relation between these two because if too much is pushed into public procurement, the minimum support price tends to become the maximum support price. The private sector should be allowed to have a fair space in the market so that the farmers can also get a good price. The third concern is unequal procurement with 90 per cent of the grain procurement taking place in Punjab, Haryana, Chattisgarh, Western Uttar Pradesh, and Andhra Pradesh while most other states are left out. That is not the correct way to take agriculture forward.

Most farmers feel that the MSP is inadequate but there is always competition with the market and one factor determining MSP is the procurement target. The food security Act will need about 75 million tons to be procured. This could lead to two things: either the MSP would get conditioned to this or there will be a tendency to squeeze out private trade, which could impact farm prices in the long run. The other question is: should the country concentrate only on cereals for food security or should it consider other options since under nutrition happens to be a major problem.

India cannot achieve a four per cent growth in agriculture unless the farmer gets an increase in his income. The farmer has to know that he will earn well from farming

One has to see whether PDS should be expanded to include other produce and do things differently. The way the Act is framed, it will place a great burden on food subsidy and might dent public investment in agriculture. That will be a big problem for the farming sector as, in the long run, public investment in agriculture will be very important for food security. Another concern is around the kind of production model that will be followed. Currently, there is a big stress on a few states like Punjab to produce, which is impacting on their natural resources like ground water and soil. Inspite of this, they continue to maintain production. This cannot continue for long nor can India depend on imports for food security because of problems of volatility and availability. The total tradeable rice in the world, for instance, is just 35 million tons. Half of this is highly priced and India cannot afford it.

This exposes India's the frailties of intervention based on subsidized cereals. Instead, the country should first focus on the three IFPRI indicators while tackling hunger. Second, each state should be allowed to tackle hunger on its own; the uniform model for a country like India is not a good option. Third, there must be decentralized procurement, be it wheat, rice or millets, if India has to sustain agriculture. In the next 10 years, one would not wish to see rice going from Punjab to Bihar when farmers are capable of producing it themselves. Chhattisgarh has strengthened its system of local procurement and distribution and this model can be replicated. Fourth, one has to look at the agri-nutrition connect. In the food security atlas, Madhya Pradesh, stands out with the worst numbers. It is also the state with the lowest gross value per hectare in agriculture. This shows that there is a direct relation between productivity and income from agriculture and nutrition security.

While talking of food security and farming, one should take into account all farming activities such as animal husbandry and dairying under one umbrella rather than dividing it under various departments. There are a number of programmes under various ministries to support farmers. The delivery deficit happens when there is a problem in converging these programmes at the district level and they cannot be reached to the intended beneficiaries in time. Unless this administrative problem of converging the programmes at the delivery point is taken care of, devising a large programme may not get the kind of results that the country is looking for. This requires innovation in the policy space.

Finally, India cannot achieve a four per cent growth in agriculture unless the farmer gets an increase in his income. The farmer has to know that he will earn from farming on a sustainable basis and all polices have to be framed around that assumption.

Indian agriculture: comfortable output; poor management;

T. HAQUE
Former Commissioner, Commission of Agriculture Costs and Prices

The worrisome problems of malnutrition and access to food notwithstanding, India is quite comfortably placed vis-à-vis food production. While the government seeks to address these two problems, one has to ask why India should not export some of this foodgrain instead of allowing it to rot. At least some money can be earned by exporting even three to four million tons of food. There has been a ban on rice and wheat exports for the last three years despite the excess grain in the country. There has been a ban on cotton and soya exports too. Recently, the ban on cotton was lifted only when it was too late: the farmers could not earn anything from it. The government paid no heed for the four or five months when the farmers were asking for it.

The right to food is a good idea but there are issues around delivering it in a state where the government does not have the infrastructure, institutions or governance system to reach this right to the people. The government is not even been able to deliver the targetted PDS till date, how does one expect it to handle universal right to food.

The government is not even been able to deliver the targetted PDS till date, how does one expect it to handle universal right to food

This is not to say that universal PDS is not working in some states: it is but it is failing in such states as Bihar and Jharkhand, where the government machinery has not been able to deliver.

While implementing this legislation, there must be a strong focus on production across states. India has large difference in yields; to the extent of one ton per hectare in some eastern states. Around 62 per cent of the rice growing areas still have a yield of one ton per hectare though, with right technology and price, farmers are quite capable of being more productive. Their morale has to be kept high by giving them the right price otherwise the country will have to import, which will be a disaster.

Most Indian farmers deal with drought, floods and even price failure almost every alternate season. The government came up with a policy to cover these risks in the form of an insured price but offered a choice between MSP and income insurance benefit. No farmer came forward for the risk cover. An appropriate risk management structure can only ensure farmer's own prosperity and also feed the nation. This exposes strategic gaps in government's policy making thinking.

There are, however, some excellent examples of innovation. In Kudumbashree, for example, some four or five farmers lease land together and cultivate it. They do not need to depend on the ration shops. They grow almost everything including bananas, pineapples and vegetables and each member earns between Rs 30,000 and Rs 40,000 a year from an one acre of land. If there are enough income opportunities for people, services like PDS can be done away with, at least where it does not work for whatever reasons. In fact, this was the idea behind MGNREGA but it was not implemented properly and nobody benefitted from it except for a few contractors and politicians.

Ethics and economics of post-harvest food management

ALOK SINHA
Former Chairman and Managing Director, Food Corporation of India

The idea behind the green revolution, when it was launched 50 years ago, was that the Food Corporation of India would buy whatever surplus the farmer produces at prices fixed by the Commission for Agricultural Costs and Prices. In all these years, the government in its wisdom has taken the price of wheat so high that today it is comparable with the procurement prices in Australia and Canada. On the one hand, there is worry that the prices are a bit too high and, on the other, the fact is that if the FCI does not intervene and buy up the grain from the mandis at the MSP set by the CACP, the prices are likely to crash. In all likelihood, the price will fall to Rs 800 per quintal and lead to a lot of unrest with farmers even diverting from wheat to cash crops.

Thus, if one wants India's farm output to increase, one needs an agency like the FCI to go to mandis and buy grain at a minimum support price. This, despite growing stocks because of the MSP and even with the government expanding the public distribution system to increase the outflow and the armed forces and MGREGA programme lifting food. Inflow has to lead to outflow because, in this case, what one is getting is a biologically degradable commodity that changes shape, colour taste and

aroma with age. When one buys atta for the house, ones does not buy stocks for more than a month. Here the government has to buy whatever the farmer offloads in the mandis of Punjab, Haryana or Madhya Pradesh, for instance. Common sense demands that whatever comes in should go out at a regular pace. The government wants the FCI to mop up everything that comes in the mandis. The inflow last year was 550 lakh tons. This year, it will be more than 600 lakh tons but the outflow will be no more than 350 lakh tons or 400 lakh tons. The net addition to the FCI and its agencies' godowns will be between 150 lakh tons and 200 lakh tons.

Every year in April-May when the media reports rotting grains and lack of storage. This has come too late in the day. As a CAG finding says, the percentage of grain with the FCI that goes bad is less than half a per cent, which is comparable with many multinational companies. However, in an inventory of 600 lakh tons, that is a big stock to lose and unacceptable in a poor country like India. The stocks have to be liquidated and, in fact, in the long run, it is going to be expensive to keep the stocks with the FCI forever. When godowns were created in the 1960s, there were near the railway stations and land was not so expensive. Today, with growing urbanization, when the land near railway stations and transport hubs is expensive, it is no more feasible to construct godowns for the FCI, given that the rentals that the corporation can afford are not very high.

It has to be accepted that India is a poor country where 48 per cent of the children under the age of five is undernourished. Worse, this figure is double that of sub-Saharan countries. The weight of Indian children at birth is the lowest among the SAARC and even the BRICS countries. There is also the problem of rising prices while the farmers do not get paid adequately. There are contradictions everywhere; even as one sympathizes with the farmers who are not getting cheap labour because of MGNREGA. One is aware of the other side of the coin: these landless labour do not have to get hired at cheap rates.

In such contradictory times, when the government buys up the entire wheat outout, by June-July the market gets squeezed out of wheat. The wheat is in the godowns and not with people who need it cheap. This even as the government incurs a huge expense to hoard the wheat because even the FCI takes loans to pay up the MSP and recovers the money only when it sells it to the state governments or other agencies.

Financially, democratically and even ethically, the food should go to people for whom it is meant and the food security Act is the only way out. The main argument against it is that there is not enough money for it. The cost of implementing the Act has been estimated at Rs 75,000 crores and, if one were to to by the way it has been presented in Parliament – in a convoluted form – the recurring cost per annum would be another Rs 25,000 crores to Rs 30,000 crores. Nobody batted an eyelid when newspapers published photographs of Rafale jet fighters that the country will buy for Rs 2,000 crores. Nobody asked if India really needs them. Even economically, it makes good sense to implement the food security Act because if a person buys food at cheap rates, his purchasing power for other things would go up, which would be good for the manufactured goods sector of the country.

When it comes to black money, the PDS is contributing to the black market as one third of all

Financially, democratically and even ethically, the food should go to people for whom it is meant and the food security Act is the only way out

ration cards are ghost cards. This means that the food grain is being siphoned out of the system or being illegally sold in Nepal and Bangladesh. Reforms in the PDS are thus essential and achievable as has been in states where the Panchayati Raj system is well-established.

Finally, even states with marketable surplus food are not necessrily food secure. Chhattisgarh, for instance, is doing very good work in terms of rice procurement but in the four districts of Abujmaad, people are so poor that paying Rs 5 to become a voting member of the CPI-M is a big thing for them. Also, thanks to India's inability to integrate with the tribals, there are no PDS shops in the Abujmaad forests. Those that were started have been taken out of the area and located near the CRPF camps. Today, nobody comes there at all.

Myths around implementing food security

BIRAJ PATNAIK

Principal Adviser, Office of the Commissioners to the Supreme Court in the Right to Food Case

There seems to be much concern over farmer interest being adversely affected by providing cheap food to the needy. Evidence shows otherwise. In states like Tamil Nadu and Chhattisgarh, where procurement is good and PDS is working effectively, farmers are more than happy to sell their grain at a better MSP. Some 80 per cent of India's farmers has less than two hectares of land and 70 per cent is also net purchaser of food. In Chattisgarh, where both procurement and PDS are effective, it literally works as an income support transfer to the farmer. A farmer who would earlier keep 70 kgs for household consumption and sell the rest as surplus now keeps only 35 kgs, for instance, and sells the rest at a better MSP. He then goes back to the ration shop every month and buys rice at between Re 1 and Rs 3, depending on which side of the poverty line he is on. So he earns more.

There is also great concern about the MGNREGA. If the farmers are not getting agriculture labour, surely these labourers are going out for NREGA work, otherwise there would not be so many complaints from farmers not getting labour at the earlier low wages. Even if one dismisses the MGNREGA as completely bogus – with all the money leaking out – the labour would have to go to the farmers to earn a living. Surely the money is reaching the agricultural labour somewhere.

The food security Bill, in its present form, has certain problems. For one, it reinforces the targetted approach of above the poverty line (APL) and below the poverty line (BPL) and in fact makes matters worse than they currently are. The Bill says that 28 per cent of the urban population and 46 per cent of the rural population will get 35 kgs of food grains at Rs 3 (rice) or Rs 2 (wheat) or 1.44 per cent of the urban and 22 per cent of the rural population will get it at half the MSP while 10 per cent of the urban and 15 per cent of the rural population will be completely excluded. Why have such a complicated formulation? All these years, the government has been saying there is not enough food available but for the last three years, one has been seeing a problem of plenty. It is understandble for the government to keep a buffer for calamites such as droughts but why cut down on entitlements then? The government can give 25 kgs if 35 kgs is too much but it must be kept uniform for at least 70 per cent of the population if not all in terms of price as well as entitlement. It can exclude those who do not meet the exclusion criteria.

Another problem with the Bill is that there is no talk about nutrition security and neither is there a package for farmers. I personally campaigned with the National Advisory Council that the MSP should be made a legally tenable right as part of the Food Security Bill. The government refused on the grounds that it has enough grain with the FCI and the markets will get squeezed out and so on. In the same breath, it was said that there is not enough grain to bring in universal PDS.

Any right based legislation should be founded on the principles of accountability and justiciability. The Right to Information Act worked because its mechanism was independent of the implementing agency, a mechanism that is separate from

The Supreme Court ordered last year that 50 lakh tons of food grain be distributed to the poor. Till date, not more than six lakh tons has been lifted by the states

government. The same was to be the case with the right to food. By the time it came out of Krishi Bhawan though, no principles of accountability survived. The Bill that has been tabled in the Parliament allows for anybody, be it a retired or serving bureaucrat, belonging to any cadre, even if he has no experience in implementing food and welfare schemes, to be the head of the national authority for holding people accountable. Finally, there is the clause which says that in case of a natural disaster, the government will not be accountable for delivery of food. Thus the clause allows the state to walk away when it is required the most.

There is a myth in this country that the food ministry runs the food economy of this country. It might be responsible for a few problems but the ministry definitely does not drive the food economy of India. In fact, it is another helpless player. The actual people running the show sit in the finance ministry. In order to keep the fiscal deficit low, the finance ministry announces unrealistically low levels of food subsidy year after year. Its always Rs 20,000 crores less than the revised estimate of that year. Smaller budgetary provisioning means that the FCI's payments get held up.

As of today, the government of India owes the FCI Rs16,000. The FCI, in turn, cannot pay the state agencies that in turn, do not pay the farmers or they get a bad credit rating and go bankrupt. Eventually, states do not want to get into decentralized procurement. States that have decentralized procurement do not get easy credits from the Reserve Bank. The interest rate for state procurement agencies is 11.75 per cent while it is five per cent if one wants to buy a Mercedes. For FCI, the rate is 10.75 per cent, which is very high.

There is the other contentious issue of food exports. The Rangarajan Committee report on disbursal of excess food grains has recommended that eight million tons be given at BPL rates, two million tones at APL rates, two million tons be reserved for export by state agencies with the government providing a subsidy and one million tons be given to private traders for export, also with the government providing the subsidy. Of the 10 million tons reserved for the poor, not a single grain will be lifted.

The Supreme Court ordered last year that 50 lakh tons of food grain be distributed to the poor. Till date, not more than six lakh tons has been lifted by the states. This is because states have to put a further subsidy after the BPL and APL rates given by the centre. States do not want to put a further subsidy of Rs 3 to Rs 6 per kg for an adhoc allocation of three months. Therefore, states like Bihar have not lifted even five per cent.

Finally, what will happen – as did during the NDA government in 2002-04 – is the great export subsidy scam. These exports are doubly unethical because this food produced by the farmers for Indians will be used as cattle feed. It will be extremally ironic if our government subsidizes cattle feed in America. That such exports may never happen is because the exporter would show an invoice of an export having been taken

As long as the food ministry continues to operate under the tyranny of the Group of Ministers headed by the finance minister, there will not be much change in the food economy front.

place and then divert it into the black market.

Such exports will not help farmers who will not get a higher MSP for this export. In any event, exports will be handled by middlemen. So the notion that export of grains is going to help farmers is wrong. Structurally, as long as the food ministry continues to operate under the tyranny of the Group of Ministers headed by the finance minister, there will not be much change on the food economy front.

Showcasing the millet option

P. V. SATHEESH

Director, Deccan Development Soceity and National Convenor, Millets Network of India

Consider the per capita availability of foodgrain between 1960 and 2007: there has been only a 4.8 per cent increase in the per capita availability of rice. The 1960s are significant as the watershed when green revolution was introduced and the general assumption is that a lot of foodgrain came in after that. In wheat, of course, there was a 50 per cent increase but India has lost on other cereals like millets by 50 per cent at the same time. Thus actually, there has been no increase in food production. Besides, there has been a 40 per cent loss of the gram and 45 per cent loss of pulse varieties. There is thus some confusion when one discusses food and nutrition security vis-à-vis conditions obtaining prior to the green revolution. In fact, India's past agricultural practices took care of all its nutritional or cereal requirement. Today, one has had to come up with various schemes like the horticulture mission and pulses mission. If only one could restore the biodiversity that existed because of millet cultivation, one would not have been in these straits.

There is another false perception around millets, which come in a vast variety: that one cannot not cook as many dishes with it as one can with wheat and rice. The truth is that every possible Indian dish: dosa, idli and even ladoos can be cooked with millets. Also, millets offer an enormous amount of nutrition which rice and wheat cannot, be it major or micro-nutrients. The reason India is the diabetic capital of the world is because today it has lost most of its millets. Bajra, or foxtail millet, for example, is twice as rich in proteins than rice. Millets being highly fibrous are not difficult to digest because they do not contain much carbohydrates. Mandua, a millet, gives 344 miligrams of calcium whereas rice can gives only 10 miligrams and wheat only 41 miligrams. So why were these healthy grains abandoned?

Inspite of this marginalization of millets, India is still the world's largest millet consuming country. It consumes about nine million tones of millets every year. Sub-Saharan countries score better than India on the nutrition scale, probably because they consume millets. In the last 20 years, 35 per cent of India's millet growing area has been lost and four million hectares have become fallow. One of the main reasons is the

country's wheat and rice obsessed public distribution system. Strangely, millets have become a food of the elite that is discovering new health concepts while the poor are being deprived of it.

Another challenge facing the country is climate change. By 2050, there will be an estimated two degree rise in temperature. This might lead to wheat dissappearing from the Indian landscape as it is an extremely thermal sensitive crop and might not be able to sustain the temperature rise. With rice, the problem is with the way it is grown, with a lot of water and chemicals that generate methane, a green house gas. India may well have to give up growing rice. Only millets can save the country in the changing climate scenario. There is also the question of water: six million litres of water are needed to grow rice in a one-acre field. In my village, this much water can sustain 300 families for a week. Can Indian be so profligate in the use of water with such acute water shortage predicted?

Then again, rice production is based on false economics. Even if the water is priced at 10 paise per litre, it should be sold at Rs 210 per kg, which is not the case as of now. Traditional millet farming, unlike the chemical packages post green revolution, does not require any irrigation. It completely depends on rain water and has a biodiverse system where a lot of millets are grown together. Millet crops are also carbon sequesters, they push the carbon back into the ground, which is another crucial need to tackle climate change. In a classical millet farm, one can easily tackle the crisis of scarcity of pulses and oilseeds too. In a millet farm, there is a line of millet, then a line of pulses and then grams that can be grown across the field. So all the soultions are embedded in one farm itself.

National food security is a dated concept. What must be looked at is food soveriegnity, where every farmer is able to grow food in his farm without any external input. There is enough food grain in this country and the output is growing but hunger survives because the entire food production system is centralized. Even in Mizoram, one can find the Punjab rice, which the people there hate because it is not a part of their culture or food system. So why cannot Mizoram be allowed to grow its own rice varieties and consume it? It would save the country large sums currently expended to transport food across such a huge distance especially when fuel prices are shooting up by the day. Also, there is 25 million hectare of cultivable fallow land in this country. If this land is cultivated, another 40 million tons of grain can be produced. Even MNREGA can be used for this work.

The government can encourage the millet farmer and inentivize him.

- First, he should be given a water bonus for conserving water.
- Second, he should be given a climate change bonus for being climate compliant.
- Third, he should also be given an incentive for conserving the biodiversity of the farm.

If these combined incentives are given to a millet farmer at the rate of Rs 5,000 per acre, most problems related to agriculture can be solved. It is not a big amount. For 30 million hectares, it amounts to about Rs 15,000 crores a year. This amount, in this scam-ridden country, is a pittance.

The Deccan Development Society (DDS) has been following a system of local procurement, local storage and delivery to attain food security. Farmers who cannot cultivate for want of investment are identified and given a loan of between Rs 2,500 and Rs 4,500 that they have to return in the form of grains. This grain is stored in the village as a community grain fund, out of which food entitlements are made to the poor who are identified by the village community. There has never been a complaint with this system for the last 15 years now that it has been running. The DDS is working in about 120 villages; the programme is feeding 50,000 families; and it is inexpensive to administer. In 1990, the National Institute of Rural Development estimated the economics of the DDS model of PDS and found that while for every Rs 7 that the government spends on PDS, only Re 1 reaches the benficiary, in the DDS model, for every Rs 1.60 spent, Re 1 reaches the beneficiary. Besides, it creates multiple livelihoods, fodder and nutrition security amongst other things. It is time that the country stopped being fixated with the idea of rice and wheat and look at the multiple options.

While for every Rs 7 that the government spends on PDS, only Re 1 reaches the beneficiary, in the DDS model, for every Rs 1.60 spent, Re 1 reaches the beneficiary

Getting the Act together: six areas of concerns

N. K. SINGH
Member of Parliament; Deputy Chairman, Planning Board, Government of Bihar

The government, recognizing the absence of a credible social safety net in India, has begin to embody these obligations in the form of legal justiciable rights. Acts such as the Right to Education and MNREGA have been embedded as legal, enforceable Acts. The Right to Food Act has been drawn on the same lines and will soon become enforceable. The first question to ask is: is this the right direction to go?

In the case of right to education, for example, the Act has itself created a number of problems for want of adequate preparation to implement it.. There is no questioning the fact that everybody in the country has to be well-fed; that the country has to rise from the low ranks on the global hunger index; that the right to decent and dignified livelihood should become a part of everybody's life but the need is to get the basis of these Acts correct. One has to learn from experience. Both the Right to Education (RTE) and MNREGA have been imperfect Acts. The government has already made two amendments to the RTE Act. The right to food, therefore, should not be a knee-jerk reaction to electoral concerns and civil society pressure like it was when the Bill was introduced in the Parliament.

Six concerns crop up as one seeks to move forward. The first: what is the scope of this legal entitlement; should it include all or BPL only. Since it is to be a law passed by the Parliament, it would be universal in nature.

- First: the government must resolve this confusion around whether it is for everybody or would it be based on categories?
- Second: if the government does decide that it cannot give food entitlements to all at this stage, how does it define poverty? Will it be on the basis of calorific value or on the basis of a dignified life, which embraces safe drinking water, sanitation, nutrition security, availability of vitamins and a right to healthy and productive life.
- Third: when one begins the ardous task of defining poverty, one finds a plethora of definitions and methodologies that compute poverty. Currently, there are six ways in which poverty is being defined, including those by the Supreme Court lawyers on the findings of the Wadhwa Committee, the state governments' definition, by the Tendulkar Committee and N.C. Saxena as well as those of the World Bank and the ADB. So one needs to be clear about the methodology being used to compute the number of poor people.
- Fourth: there is concern around the level of entitlements. Should the entitlement be different for different segments or be given at different rates? Should it be an extension of the targetted PDS, which has its own flaws or, as the Finance Minister announced in the budget, should all the anti-poverty schemes be replaced with a system of cash transfer? As per his announcement, 40 districts in the country will begin to recieve cash transfers by October this year.
- Fifth: what changes in productivity and agriculture patterns will be required to sustain the food security Act and what changes will the global food market or the government have to bear in terms of subsidy as a result? There are enormous financial challenges as well as those of reforms in agriculture that the government should get prepared for.

In a submission to the Standing Committee on food security, I said that all states should be kept

Right to Food should not be a knee-jerk reaction to electoral concerns and civil society pressure like it was when the Bill was introduced in the Parliament

in the loop while designing this Act. The states feel that the Act will cast enormous obligations on them as the financial memorandum – a statutory annexure, which talks of the cost of implementing the Bill – does not talk about the financial burden of the already stressed states. For instance, it states that the cost of the schemes for pregnant and lactating women and ICDS for children under 14 years of age will be shared between the centre and the states. This cost has not been calculated, neither have states been consulted on this. Likewise, there are other provisions about cost sharing on maternity benefits or entitlements for the homeless and destitutes and such others, on which there has been just no discussion with the states. Non-recurring costs like identifying the destitute and homeless people or the creation of storage facilities are also required to be borne by the states.

The bottomline is that while India does need a food security Act, it needs an Act in which all its features are correct and in place to ensure that the noble intention of providing food to all does not fail.

Raising the bar: the FCI challenge

SUSHIL NAGPAL
Executive Director, Food Corporation of India

Thanks to good monsoon in the past few years, there has been a hike in the foodgrain production and procurement. This year there will be an estimated 350 lakh tons of wheat, surpassing all records. The FCI estimate for this season was a maximum of 318 lakh tons but it has already got 328 lakh tons and procurement is still on Bihar, Madhya Pradesh and some other states. The estimates for Kharif rice are also similar and for Rabi and Kharif combined, the FCI will be procuring about 70 million tons of foodgrain, which is an all time high. As a result, FCI is carrying a stock of over 80 million tons, which is also the highest ever. Thus far the FCI has been managing only between 60 million tons and 62 million tons and raising the bar will pose new challenges for the corporation because there is a difference between the procurement and offtake. In the past, about 70 million tons have been given out for PDS but the states have not lifted more than 50-53 million tons. This gap has been increasing over the years.

There is need to keep a buffer stock of around a maximum of 32 million tons, which is why the FCI has never had the experience of storing such huge quantities. The government now has an ambitious scheme to construct more storage capacity of about 15 million tons in various states. Of this, 90 lakh tons of capacity has been awarded for construction but there has been an eight to nine months' delay in many states for various reasons; unavailability of land, amongst others. Punjab, for example, has a storage capacity of about eight lakh to nine lakh tons but it has not been able to take possession because preservation measures, for example, have not be installed nor is there quality control staff.

There is also a 0.002 per cent crop damage with FCI stocks and some problem with the state stocks that have been kept for the FCI pool. However, various measures like cap and shed storage are being taken to minimize the damage. One possible solution is to bring about a change in the MSP regime so that the private player also gets a level playing field. As of now, there is no private player in the market when it comes to wheat. This will also reduce the FCI's burden and benefit the farmer.

Time for institutional innovation in farm sector

TUSHAR PANDEY,
President, Strategic Initiatives, Government & Advisory, Yes Bank

There is a great deal of misunderstanding around the concept of public-private partnerships in agriculture, especially around storage of grain. This extends to even the government that has implemented such partnerships in other areas. If one considers national highways, there were a lot of initial hiccups in the programme, in the 1990s, when the construction began. Then toll roads were introduced and slowly the concept of institutional innovation found its place in all public sector bodies that accepted PPPs. Benefits for the local people were incorporated in the big picture and even today a tractor does not have to pay toll while going on these highways. There is immense scope for PPPs in the agriculture sector.

Curiously, if one visits a state agriculture university and asks people there about the profitability of one of their floriculture farms, one does not get an answer, which only the tender procurement officer is supposed to know. Even the university does not know when its land is used for an industrial venture. Were a company or a farmers' group to set up such a model high-tech demonstration farm, it would look at profitability issues: for instance, the profitability of setting up a millet farm. So institutional innovation in the farming sector is very crucial.

Reports have been submitted by us for the National Agri Innovation Programme. One is on centre-state relations in systems in agriculture in which was sought the transfer of agri-marketing on the concurrent list but no debates have taken place after the initial report submission. There is also the banking angle. Bankers push credit in the market for a project but not for a farm, which is still not considered a project in the professional sense. Should this mindset change, one can expect success as has been accomplished in other sectors.

Farmer as a rural entrepreneur

VAISHALI CHOPRA
Senior Manager, Rabo Bank

Food is something that cannot be replaced by cash. Only a farmer can grow food and the Rabo Bank consider farmers as rural entrepreneurs who are helping bridge the productivity gap. A report has been prepared by the Rabo Bank to encourage this. Innovation and investment are, however, needed for wider emergence of the farmer as a rural entrepreneur. There are scientific innovations in terms of new seeds and other things that need to be taken forward from the laboratory to the land. If one seeks improved productivity, there has to be investment in R&D and mechanization. The farmer too must be integrated in the value chain and not just remain a producer. He must be kept in the loop on the prices that his produce is being sold at or

being bought by the customer. There must also be backward and forward integration in terms of farm inputs as happens in countries like China, where there are small holdings. The farmers buy fertilizer in bulk, blend it and use it. This results in saving. The forward integration has to be in the form of farmers having a say in the retail operations.

Farming fields not for dangerous games

MANAS RANJAN
Programme Manager, Action Aid

I am a farmer's son but I do not work in a farm. I work in the service sector. There is a very volatile relation between a farmer and a farm labourer, like the one between extremists in a communal riot. It is presumed by most that supply of farm labour has fallen because of the MGNREGA. However, figures for 2007-08 show that there were only 244 crore work days that year, which went up to 216 crores in 2008-09. In 2012, however, the number of work days under the MGNREGA fell to 211 crores. If that be the case, farmers should have got labour at a reduced rate. Since that has not happened one has to look for a reason because the MGNREGA work days are definitely falling.

There has been a traditional rivalry between farmers and labourers. The former accuse the latter of being shirkers and the latter complain that they do not get paid adequately. This has now gone up to the extent that farmers feel that the labourer is anyway getting work under the MNREGA and even getting cheap cereals, which is why he has to sell his grain cheap. Is that true? The labourer knows that a farmer gets a good subsidy on tractors and harvesters. His main source of income from the farm is at the time of sowing and harvest and he feels that the government is killing his livelihood option by giving this subsidy on mechanization. Is mechanization then good for a small farmer? If that was the case, there would still be many small farmers in America. As per international norms today, however, a farmer with land less than 1,000 acres is not able to survive in America. He will not be able to do so even in India. Both the MNREGA and mechanization that have pitted farmers and labourers against each other and this will be dangerous in the long run, especially for small farmers. The farmer and the labourer have a very intrinsic bond that the government is attempting to break.

As far as storage is concerned, in 2008, the government directed the FCI not to spend any more funds on creating storage capacity but to take on lease godowns from private companies for a minimum of seven years so that the private investor was encouraged to construct. This was increased to a lease of 10 years. Why was the FCI not allowed to construct godowns on its own if it was to pay a rent for such a long period. Last year, the import duty on the material required for setting up these godowns was brought down to nill to help these companies. They even get a Nabard subsidy for such constructions. In 2001, the budget for storage accounted for half of the agriculture budget. In 2012, the situation is opposite and funds that could have been given to FCI for storage are going to private players. The hidden agenda for private players is FDI in retail. When that happens, a lot of storage space will be needed by these private players. So they are looking at a long-term plan of taking the subsidy for 10 years. Who can force them to rent it out to the government again? ●

As per international norms, a farmer with land less than 1,000 acres is not able to survive in America. He will not be able to do so even in India

INVESTI
GATION

HIMACHAL PRADESH:

How Green is My Apple?

Ashim Choudhury

Photo: Ashim Choudhury

Beyond a certain height in Himachal Pradesh, an apple orchard meets your eye no matter which direction you look at. It is a delight, seeing a bunch of red apples or plucking them. Apples are everywhere whether in upper Solan, Shimla, Kinnaur or Kullu. They are grown in seven out of 12 Himachal districts, accounting for 88 per cent of the state's fruit area. This begs the question, are apples leading to monoculture? Are they hampering crop and bio-diversity? These are questions that should be asked but are not being asked seriously.

"Farmers will grow what gives them a good return", is a common refrain among horticulturists and farmers. There are other voices of concern and disquiet among experts, however. They feel that Himachal is becoming over-dependent on apples while other fruits from the hill state's basket are being neglected. "A monocrop of apples can be dangerous not only from a bio-diversity perspective but also from a crop failure angle", says J. P. Sharma of the Regional Horticulture Research Station in Bajaura, Kullu.

"We are asking people to diversify, as a cushion against apple crop failure, to vegetables and fruits like pomegranates and kiwi that can be equally or even more remunerative", he says. He advises caution, recalling occasions when apple failure had virtually crippled the state. Half of Himachal's 67 lakh population is directly or indirectly involved in the Rs 5,000-crore 'industry'.

Sitting with a few apple growers in Naggar on the upper reaches of the Kullu valley, my attention turns to a majestic walnut tree. "Why do you not grow walnuts?" I ask the farmers. One of them answers: "You see how much space it takes up. I could grow six apple trees in that much area". He makes a quick calculation of how much each tree would pay him back, which is far more than the return from the walnut tree. This economic logic is ensuring people's faith in apples.

Surinder Pal, a young farmer from Narkanda in Shimla district, has another point: "Nothing grows under a walnut tree, whereas under an apple tree you can grow vegetables like French beans or rajma (kidney beans)". Moreover, "you invest in a walnut tree and the next generation benefits", he says. A walnut takes at least 10 years to bear fruit (The Y. S. Parmar University has developed hybrids that yield fruits in three or four years). "What about the invaluable walnut wood?" I ask. "The government does not allow you to cut your own tree, although forests are being cut", he laments.

Cherry has seen a new-found interest among fruit growers but its short shelf life goes against it. It is the same with strawberries, plum, peaches and apricots. Surinder has 250 apple trees, 100 pears, some peaches and apricots in his farms. With big players like the Adanis and Reliance pitching stakes in the apple industry, selling an apple peti of 25 kgs for Rs 1,800 at his farm is not a big deal. No wonder he, like many others, swears by the apple. In Kinnaur, which produces the best apples from the state, it is not uncommon for farmers to get advance cheques from buyers like the Adanis or Reliance. "Kinnaur now has the country's highest per capita income thanks to apples", says Prashant Negi, a professor in Delhi, who also doubles as an 'orchardist' and has an orchard each in Shimla and Kinnaur. "Apples are economically viable", he says.

The question of diversity assumes even greater significance with the threat of climate change looming over apple growing. "Apple is a temperate crop and requires a long winter chill – a below 70C temperature for 1200-1600 hours to break the 'dormancy' of the apple tree", says Vijay Singh Thakur, who heads the Regional Horticulture Research Station (RHRS) in Mashobra, Shimla. "We are already feeling the effects of climate change", he says. "The apple crop has become uncertain. In the last 15 years there have been just two or three bumper crops….Winter in Himachal is shifting from November to January (winter in Shimla was "cozy" last December) giving rise to diseases like apple blotch and premature leaf fall", he admits.

In the second week of April this year there was harsh spell of hail storm that led to fears of an apple crop failure. Fortunately, the damage has been in some pockets only. "As kids I remember it used to hail for a minute or two…Now it happens for two three hours and can devastate the tree and

Photo: Ashim Choudhury

Photo: Ashim Choudhury

Four Zones

Himachal's uneven topography is divided into four agricultural zones.

Zone 1 is the lower reaches below Solan – rich in vegetables and other sub-tropical fruits like mangoes; yes mangoes.

Zone 2 above Solan is broadly between 6,000 to 6,500 feet – rich in fruits like pomegranate, plum, peaches, apricots, walnut, green almonds and now Kiwis.

Zone 3 broadly between 6,000 and 7,500 feet is where most of the apples, pears and cherry grow.

Zone 4, above 8,000 feet, mostly in Kinnaur, is also where the best apples grow. Having longer winters and less rain the apples here are less prone to pests and diseases and virtually chemical free.

Within the apple family there is a disconcerting tendency to grow a single variety that commands the best price, the Royal Delicious ~~Eperspernam, qui repere vel impeliquid~~

apple fruit", points out Thakur. Farmers today are gearing up for plans to have protective plastic nets over the trees. This will be a massive contaminant, given the large scale of apple farming, and threaten the state's fragile environment. It maybe recalled the Himachal has achieved commendable success in banning plastics.

Despite taking up nearly 90 per cent of fruit area in the state and its uncertainty in the context of climate change, the area under apple cultivation is increasing each year, quite a bit by encroaching on forests (SEE BOX 1). Ironically, forests are critical to apple plantations because they help in maintaining high humidity (and low temperature), which is important to make the apple juicy. Even within the apple family there is a disconcerting tendency to grow a single variety that commands the best price, the Royal Delicious.

"Out of 10 to 15 varieties that are commercially grown, the Delicious takes up 80-85 per cent of the total area", says M. S. Mankotia, a senior scientist at the RHRS in Mashobra. "Incidentally, the Delicious variety is most susceptible to climate change", he says. "We are persuading people to go for more diversification within the apple crop". Ideally, an orchard of 100 Royal Delicious should contain 30-35 'male pollinizer' varieties like Golden Red for best results. That is not happening. During the flowering season, there is a mad rush to get 'male' Golden stalks and tie them in little plastic bags full of water. The residue from this 'artificial pollination' – plastic packets – is another concession the plastic-free state makes for apples.

R. C Sharma, Director, Research at the Y. S. Parmar University in Solan is emphatic: "Yes apples have brought a lot of prosperity to the state but a monoculture is not good for the health of the soil and bio-diversity. Moreover, half of Himachal has a sub-tropical climate". (SEE BOX 2) He says diversification should happen and it makes good economic sense. For instance, the best peaches grown in Rajgarh, Sirmour district, are exported to the Middle East. The pomegranates of lower Kullu are as profitable as apples or even more so. Sharma is also a strong votary of Kiwis that have been recently introduced in the mid-hills.

"Kiwis give one to 1.5 quintals per mature plant and do not require a single spray", Sharma drives home his point. Apples, on the other hand, are highly intensive consumers of chemicals and pesticides (SEE BOX 3). Bees and flies, critical for apple pollination, are becoming virtually extinct, thanks to excessive use of chemicals and pesticides. Sharma cannot ignore the heavy bias in favour of apples: "When it comes to research or projects on apples, there is ready money available. Other

Photo: Ashim Choudhury

ALARMING residues

If the life cycle of an apple were to be documented, the most common occurrences punctuating it would be the chemical sprays and pesticides. Even before an apple takes the size of a pea it has gone through three sprays. In its entire life cycle it can go through as many as seven sprays. J. P. Sharma of RHRC in Kullu admits that "indiscriminate" spraying has led to a sharp decline in the bee and insect population that are vital apple pollinators. His counterpart in Mashobra, Shimla, Vijay Singh Thakur, is not particularly disturbed by the trend. "Six-seven sprays in five-six months is nothing", he says. "We have to protect against the losses from pests and diseases". He feels India uses far less chemicals and pesticides (280 gms per hectare) compared to certain countries like Italy that use as much as 11 kgs per hectare. Ganesh Goswami, 60, an apple grower in Naggar confesses that he peels his apples before eating them. What should we be doing?

Well, "residue analyses" of chemicals and pesticides have been carried out on apples and milk (of cattle feeding on grass in apple orchards) in the labs of the Y. S Parmar University of Horticulture and Forestry. These reports have not been made public. From the shroud of secrecy surrounding them one can draw conclusions that all is not well. An informal conversation with an insider reveals "alarming" trends.

Himachal Pradesh must adopt a sustainable approach if it wants apples to remain profitable and the rest of India to be ecologically alive ~~Em quame magnatu rerfers pernatusam,~~

'neglected' fruits do not get budgetary support easily", he feels. Even scientists working on underutilized fruits feel neglected as their research does not get the prominence it deserves.

As you return from your escape in the hills in May and June, you see a variety of fruit being sold on the roadside – plums, peaches, green almonds, cherries, apricots, shakkar pare (an apricot variant) to name a few. These neglected fruits, some with short shelf lives, find good custom from the summer tourists to the hills. They are not only a good source of income to the farmers and traders – cherries at Rs 150/kg, shakkar pare at Rs 300/kg – they also add much needed variety to the fruit and nutrition basket of Himachal and the nearby plains.

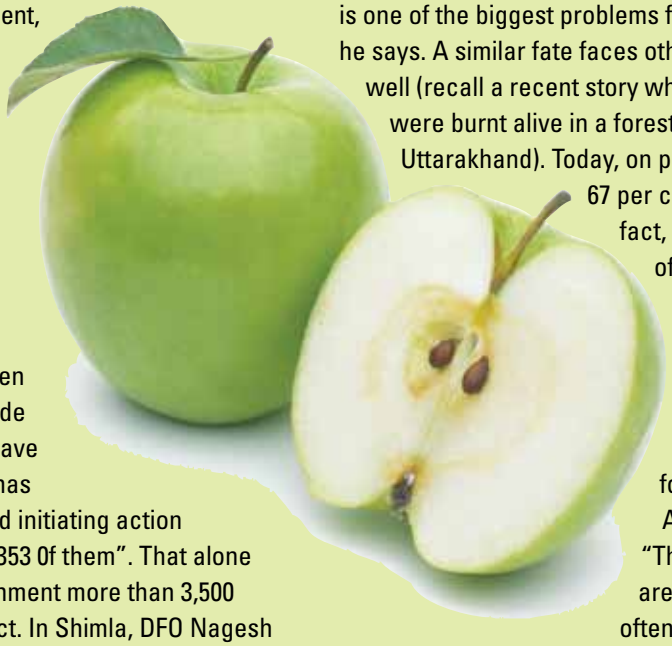
Beginning late July, all roads leading to the plains are choked with trucks laden with apples. The polluting trucks are one more 'carbon factor' that apples add to the fragile environment of the hills (there is now talk of having ropeways to transport the apples and offset the pollution from trucks). It high time that the toxic load of apples is also taken into consideration when accounting the Rs 5,000-crore apple industry of Himachal Pradesh. The state needs to adopt a sustainable approach if it wants apples to remain profitable and, more importantly, for India to be ecologically alive.

Above all, the Himalayan states are also India's invaluable carbon sink! ●

The writer is a journalist and author of the forthcoming novel 'The Sergeant's Son'.

Encroaching Forests

Are apple orchards encroaching upon the forests? The answer is a resounding 'yes' if the ordinary person is to be believed. "This is happening with the connivance of politicians and other influential people", says a senior faculty at the Y. S, Parmar University of Horticulture and Forests in Solan. Kulwant Rai, a professor in the University's Forestry department is more forthcoming: "Many orchard owners encroach upon forests … they first de-bark the tree that leads to its death and then they quietly shift the 'burji' the pillar used to mark the forest area… the pillar keeps shifting…the orchard keeps expanding", he says. According to sources, the timber mafia is also active in the apple areas where deodar forests are common. Despite the best intentions of the government, pilferage of this premium wood takes place with impunity.



In Kullu, a senior forest official, on condition of anonymity, admits to rampant forest encroachment by orchard owners. However, this has not been quantified: "We have made a list of orchardist who have encroached upon 10 bighas of forest land or more and initiating action against them. There are 353 0f them". That alone makes the total encroachment more than 3,500 bighas in just Kullu district. In Shimla, DFO Nagesh Guleria's situation is not much better as he keeps running from one forest fire to another, dousing flames mostly lit by the locals. On an average day there could be dozens of fires raging in his district. "The worst time is between April 15 and June 15", he says. This year alone more than 1,200 hectares were burnt, affecting at least 300 hectares of young forest plantations.

"This time of the year is also a breeding season for birds. These fires cause a terrible loss of bird and pheasant lives, besides loss of bio-diversity", says Guleria. As for 'orchardists' encroaching forests, the numbers in Shimla district are as bad as Kullu or perhaps worse. "But action is being initiated, particularly in light of the High Court ruling asking for police action where the encroachment is more than 10 bighas", Guleria assures.

This writer was witness to at least three simultaneous forest fires overlooking the horticulture university in Nauni, Solan. According to the office of the chief conservator of forest, this year till mid-June there have been more than 1,300 forest fires in Himachal. They have consumed nearly 16,000 hectares of area, including nearly 4,000 hectares of forest plantations.

Not all these fires are accidental. Most are lit by unscrupulous people with the tacit support of villagers, who have a mistaken belief that fires lead to quick growth of grass. "On the contrary, it leads to a huge loss of diversity not only of various types of grass and herbs but also animals and insects that are crucial links in the eco-system", says Prof Kulwant Rai. "It is most unfortunate for animals to be caught in these fires and perish. It is one of the biggest problems facing Himachal", he says. A similar fate faces other hill states as well (recall a recent story where four tiger cubs were burnt alive in a forest fire near Corbett in Uttarakhand). Today, on paper, Himachal has 67 per cent forest cover. In fact, barely six per cent of this is dense forest and 11 per cent is moderately dense. In real terms then, Himachal has less than 20 per cent forest cover.

According to Rai: "The natural aquifers are drying up. You often hear of people complaining about the 'natural springs' of the past. The loss of forest-cover and, as a result, natural aquifers even has implications for the ground water table in the plains of Punjab". More importantly, the forests play a key role in insulating the glaciers from early melting. Recent reports suggest that the Chhota Shingri glacier in the Pir Panjal ranges of Himachal is shrinking by 0.67 meters each year.

The importance of forests, particularly in the Himalayan belt, cannot be over emphasized in the context of global warming. "The dozens of dams, and power plants built on the Sutlej and Beas will become redundant without the glaciers", warns a scientist. What is imperative is that we stop the march of 'development' further into the mountains, whether it is in the form of apple orchards, industry or 'tourist infrastructure'. We can turn a blind eye only at our peril.

The Magarpatta Story

A City that Farmers Built

Amita V. Joseph

Imagine farmer entrepreneurs, who did not have to sell their land. Imagine prosperous farmers and suicides not happening anymore…..

Magarpatta, just nine kilometers from the Pune airport, is like any modern, self-contained township: gardens, lawns, flats, offices, shopping centres *et al*. It has more; a Cybercity and an electronics information technology enabled services (ITES) special economic zone (SEZ) and is ISO(Indian Standards Organization)certified! What is more unique is its genesis. It has been built and is owned by the farmers, who once tilled the land on which it stands. It is a dream come true; thanks to the initiative of one of their own: Satish Magar, who worked with fellow farmers for a decade to make it a realty reality. Magarpatta City presents another face of the Maharashtra farmer in a state share the largest number of farmers have committed suicide over the last two decades.

Magarpatta, sprawling over 430 acres, was owned by about 120 farming families with 800 beneficiaries (clan name Magar, 'patta' for land), who formed the Magarpatta Township Development Construction Company Limited (MTDCCL) and developed it,

converting their land into a value-added product that gives them returns in perpetuity.

The area was part of the Pune Municipal Corporation (PMC) from 1960, even though it was in the agricultural zone. The PMC 1982 draft development plan showed it as a zone that could be urbanized if the population of Pune touched two million. Till such time it would remain agricultural land. The government had the authority to acquire the land at prices lower than prevailing market rates under the Urban Land Ceiling Act.

The triggers

Rapid development in the area from 1990 sparked off urbanization that led to a wave of migration from the villages to the city. Agricultural land in the periphery of Pune got fragmented into small plots. In what had become a familiar story, land owned by a single family was sold off to developers and builders who offered, what seemed to be, good money to the farmers. Even though the sums were only a fraction of the profits that the realtors would make, for the farmers the lure of immediate lucre was strong, given the agrarian crisis.

The sudden access to large sums of money brought several social problems in its wake. The windfall was wasted on unproductive assets and there was no one to advise the farmers on how to invest their cash. Vices crept into their lives as they splurged on lavish weddings and took to drinking, gambling or buying vehicles. Many ran through their money and some who owned around four or five acres were reduced to working as helpers, drivers or security guards, not having the formal education to do anything else.

The farmers of Magarpatta and Satish Magar, the visionary, had three primary concerns. How to convert their land into a value added product? How to plough the money back and maximize benefits realized from it? How to avoid development-led displacement. Magarpatta had to grapple with the same problems faced by other farming

communities living near large towns, surrounded by residential complexes and enormous pressure on them from developers to sell their lands.

Leadership and entrepreneurship

A striking aspect is that the community stayed united. Given the peculiar layout of the land, people farmed in harmony and fixed dates for sowing or harvesting serially in order to economize on labour and equipment. The topography of the land supported this plan, being enclosed on all sides by natural or artificial means: a canal on one side, a railway line on the second, a highway on the third side and a *nallah* (waterway) on the fourth. It was a sort of an island where the farmers worked in isolation. All disputes were settled internally and a community spirit prevailed.

Satish Magar's family were community leaders and were trusted. They also had the largest land holding. There was, besides, a safeguard: if the township project conceived by Satish Magar failed to take off, the farmers would still own the land. They would lose nothing. He convinced them that they could collectively benefit while sharing the risks. The turning point came when the farmers decided that they would tackle property development themselves. The idea was to pool all the land into a development company proportionate shareholding, which was accepted by all. The move paid off. MTDCCL was formed by the original farmers of the area and everyone became a shareholder in proportion to his/her land holding.

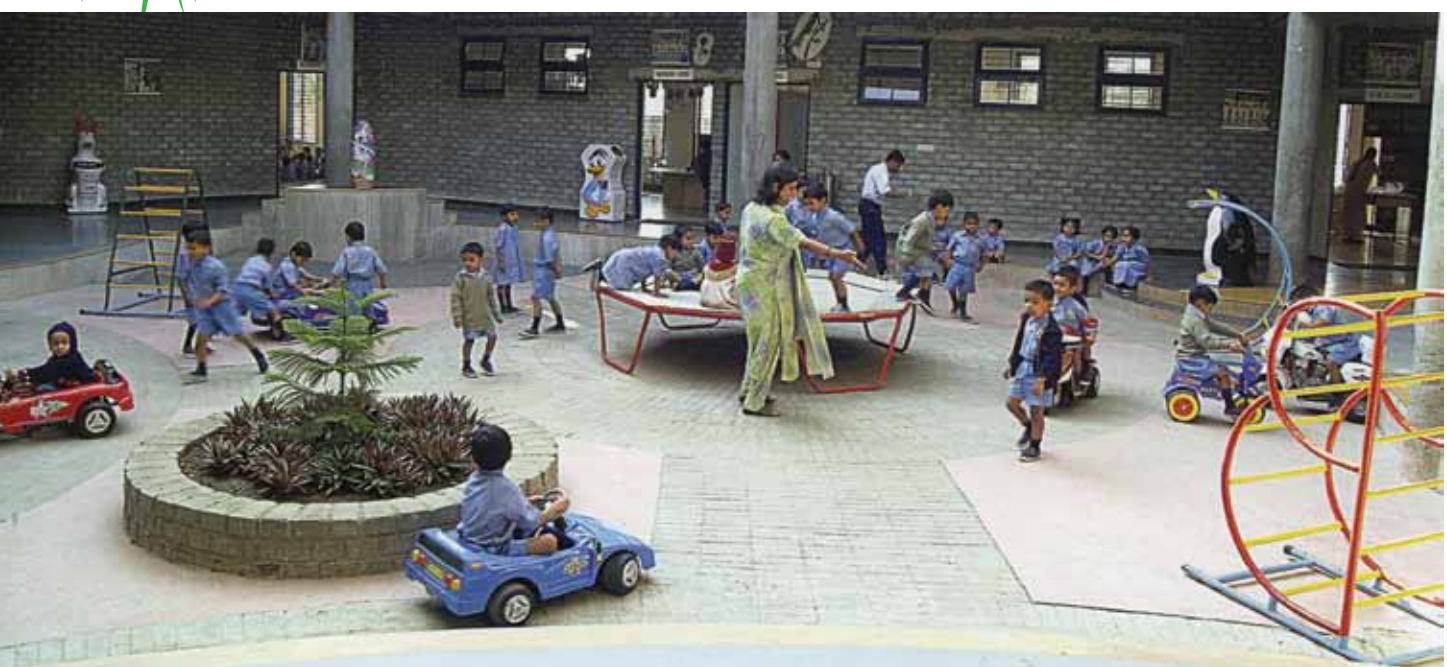
The project would be developed strictly in accordance with government rules. It took seven years to get various permissions. The final notification came in 1995: Magarpatta City was approved by the Department of Urban Development, Maharashtra. It was exempted from the provisions of Urban Land (Ceiling & Regulation) Act of 1976 and the master plan of Magarpatta City was approved by the Pune Municipal Corporation.

The township

Around 1997, a delegation of the Maratha Chamber of Commerce, Industries & Agriculture (MCCIA) visited San Jose, California. Satish Magar and the architect joined the delegation and checked out townships and city centres, visited the urban planning department and saw how space had been organized and utilized in San Jose. They also studied the planning of Singapore, Chandigarh, Bangalore and Delhi. Ravi Paranjape, renowned artist, advised town planners to have themes based on the five forces of nature. He suggested that the township have plantations, based on nature's cycles, the idea of 'ritu chakra' (ritu: season; chakra: cycle or rhythms) with specific flowers and vegetation for different seasons. The plantation was planned such that there was perennial bloom, a rhythmic splash of different colours.

Great care was taken to ensure that there was no degradation of the environment. After all, farmers were tending to their own land. They planted 25,000 trees. One-third of the Magarpatta City area, about 120 acres, was planned as gardens. Apart from this, there were trees, plantations and

The turning point came when the farmers decided that they would tackle property development themselves



green sidewalks alongside the roads. Aditi Gardens, a 25-acre circular garden was planned at the centre of the city, one of the largest open-spaced gardens in Pune today. There were separate gardens for every neighborhood over 0.5 to two acres. It was pollution-free and declared an oxygen zone.

Rainwater harvesting to canalize water from terraces was planned with more than eight natural wells, 515 recharging bores over 1.25 acres of an artificial lake recharge ground water levels in place. Interlocking paving blocks and cutout grass concrete pavers assisted in raising groundwater levels. A mist fountain, Pune's largest, was incorporated to enhance the microclimatology of the township. Waste water was recycled with three sewage treatment plants with a capacity to treat two million litres a day. The recycled water was used for gardening. A drip irrigation and sprinkler distribution system ensured conservation of water. This system kept the garden lush green and lowered temperatures.

Magarpatta City's solar water heating systems came not only as an amenity to attract more buyers but as a part of the original design and is one of the largest residential solar water-heating systems in the country today. Solar panels were installed in every residential complex. Nine lakh litres of water heated every day translates into a saving of around 13,000 tonnes of carbon emission annually. More than 7,000 solar water heating panels installed on the terraces also reduce heat effects on the top floors and save more than 17.5 million electrical units that potentially translate into more than 13,000 tonnes of carbon emission prevented every year.

All the bricks and construction material for the Magarpatta project were made of fly ash produced by thermal power plants. It was used to partly replace cement and fine aggregates. This inert material saved energy required for production of cement. Fly ash bricks help in reducing ozone-depleting greenhouse gases and are better than traditional bricks: they check pollution, lower cost, breakage and wastage, are even, have good finish and have greater compressive strength. As fly ash bricks are produced mechanically they are economical, good for any type of masonry and absorb little water. Every tonne of fly ash used in construction, reduces about a tonne of CO2 emission in the environment. Magarpatta City consumes about 130,000 tonnes of fly ash, resulting in a saving of 130,000 tonnes of emission.

Household and commercial waste, in excess of 400 tonnes, were handled at Magarpatta City. There is no garbage container inside the city because the garbage is segregated at source into degradable and non-degradable heaps and 280 tonnes of bio-degradable organic waste is processed by a bio-gas plant, an organic waste converter and through vermi-composting. More than 120 tonnes of non-biodegradable waste is sorted and recycled in a hazard-free manner, the re-usable scrap is sold to vendors or disposed off safely for land filling.

A two tonne biogas plant installed in the city uses biodegradable waste and produces non-polluting biogas, which generates power to operate most of the garden pumps. This saves power requirements equivalent to 118 commercial gas cylinders of 19

kilograms capacity per month and translates into a power generation of 270 electrical units per day. The entire sewage of Magarpatta City is treated through four sewage treatment plants and the treated water is used for curing during construction, irrigating all the green areas, in air-conditioning cooling towers and for flushing in the project's commercial premises.

Magarpatta City also has its own nursery that has vermi-culture and bio-compost pits, generating manure from garbage segregated at source. The manure composted here is used to nourish saplings and shrubs. Organic pesticides like Verticillium and Trichoderma are used extensively. The nursery sells plants, saplings and organic vegetables.

The inclusion of the principles of vaastu shastra was a marketing tool but helped in enhancing living standards by providing for light and ventilation in the residential areas. An integral part of life here is centred around the sports and recreation facility: the Gymkhana, which is what the sports complex in Magarpatta City is called. It sprawls over 25,000 square feet and has a gym, tennis courts, swimming pool, jogging and cycling tracks, yoga and meditation centres and an amphitheatre.

The state-of-the-art Cybercity with international facilities and the Magarpatta Information Technology (IT) Park, provide employment opportunities. It was created, keeping in mind the status of Pune as an important centre of education, a centre for knowledge-based defence industry units, an important manufacturing location and, in recent times, an important centre for the IT industry. The Cybercity has also been registered as a Private Information Technology Park with the Directorate of Industries, Maharashtra, which gives it a 75 per cent exemption on stamp-duty payable. Cybercity Magarpatta is approved as an IT Infrastructure Provider by Software Technology Parks of India. In August 2006, the Government of India granted approval to Magarpatta City for development, operation and maintenance of an SEZ for Electronic Hardware and Software, including Information Technology Enabled Services. The SEZ covers 11.98 hectares.

Building ownership

Construction work on the Magarpatta Township started in March 2000 with a residential block of 72 apartments and its own commercial area. Satish Magar set up a frugal organization that minimized overheads, had one small office and made every effort not to charge overheads to the company. The machinery that the farmers had was extensively used in the construction process. Farm tractors were used for shifting soil and the farmers physically contributed to the development process

of the township, making themselves partners and not mere spectators.

As a first-generation company, it maintained a horizontal organization, with free flow of information and everyone having specific responsibilities. The focus was on recruiting young people, fresh out of college or those who were in the first year; hiring people who would stay and grow with the company. The company was flexible and gave the young recruits an opportunity to study and improve themselves. Today, senior managers are those who have worked their way up and know the ground realities. Interestingly, there is no formal human resources department.

Over a period of time, the company has built a culture of involvement and participation of all its employees in all activities of the organization. Employee feedback is sought on all matters. Regular, face-to-face meetings are held every week with all department heads and the consultants. This ensures that everyone has a sense of belonging while consultants are acknowledged for their innovative work. The company employs between 1,400 and 1,500 people with fixed term employment for about a 1,000 people.

A very important aim was to upgrade the capabilities and skills of the farmers so that they adopted other professions suited to their temperament

MTDCCL is ISO 9001:2008 certified. The organization has developed and documented a standard system operating process for all aspects of their work. Processes have been created for every department. The organization has a board selected from among the original 120 farmers that meets once in three months when members are updated on the activities.

Farmers as entrepreneurs

Satish Magar, being from the community, understood the psychology of a farmer. He is an owner, an entrepreneur; not an employee. Developing a township and getting financial returns was just a part of the larger vision. A very important aim was to upgrade the capabilities and skills of the farmers so that they adopted other professions suited to their temperament. Keeping this in mind, entrepreneurs among the landowners were identified and trained.

From each family a person was involved in construction-related work with returns from the project continuously accruing to the businessman. As a shareholder, he did not work for the company. The critical aspect was respecting the sensitivity of farmers. Activities that could be done with some amount of training were identified with a focus on all those activities that could be done under supervision and guidance and did not need technical expertise.

Those in the 18-30 years age group had weekly office meetings to discuss what each could do. Some wanted to do landscaping, others road-building and so on. Even senior citizens wanted to be involved because the work provided earning opportunities. People who were identified and were willing to take up various construction-related activities were sent to study at the National Institute of Construction in Pune and 240 entrepreneurs from 120 families were trained. From manufacturing of construction material, infrastructure development such as development of roads and landscaping, building houses, internal electrification work, and putting conduits — nothing was left uncovered. These entrepreneurs became contractors and participated in a number of activities like fabricating aluminum windows, doors and grills or doing the wood work or constructing of roads, engaging in construction using reinforced cement and concrete, tiling floors,

making bricks out of fly ash in a brick making plant and so on. Today, 90 per cent of these entrepreneurs pay taxes because their businesses earn them more than Rs 40 lakh a year. They are no longer dependent on the monsoons or on minimum support prices. They have become self-sustaining entrepreneurs.

Financing the township

"How can farmers come together and execute a 400-acre project?" was the initial reaction they got from most people they approached, says Satish Magar. HDFC was one of the few banks that came forward with support, advising them to start small and grow big. It sanctioned a loan Rs 2 crores for developing the infrastructure, telling the group that it would have to hard sell since it was a large project and the company did not have credentials. It had to start with marketing the bungalows to get cash flows going. Magarpatta started with Rs 2 crores, paid Rs 40 lakhs to the Pune Municipality Corporation to sanction the plan and began the project with Rs 1.6 crores. The basic problem during construction was with creating confidence in the mind of the buyers that the township would actually come up. This was very important because the entire construction cycle was based on people booking property and making down-payments.

'Buy a house, get a city free'

The market for the township was the upwardly mobile middle class that would be happy to innovate. It valued knowledge as equity and would be interested in the 'walk to work, school and recreation environment that had been planned'. It would be interested in the value proposition of a clean and sustainable environment, good living standards, a modern educational system, state-of-the-art working conditions and security.

It was difficult to find buyers initially. So it was decided to develop the infrastructure so that people who visited the township would find it attractive. The main roads and the gardens were developed. The township was co-branded with HDFC and marketed aggressively. True scale models of buildings were created in three dimensions so that buyers could get a feel of the place. Magarpatta started with one building of 72 flats in year 2000. There are 258 buildings as per the master plan. It was open about its identity as being farmer-owned. The media too played a very major role in the making of Magarpatta.

It delivered on its promises: trees were planted, the stated width of the road strictly adhered to, with no shortchanging of the customer. People bought that dream and that meant tremendous benefits to the farmers. The model was a revenue-sharing one with all landowners entitled to a percentage of the sale proceeds in proportion to their land holdings as and when sales accrued.

The joint development agreement, where all the parties signed up with the company, was a single document. The percentage of land holding was determined. It was an indivisible share in the entire land. All the farmers became percentage holders of the floor space index (FSI). This ensured that everyone was on an equal footing. The revenue share model was adopted where 30 per cent of sales proceeds would be shared if property was constructed on the land. For plots sold, 60 per cent of the proceeds would be shared because plots needed little investment. The revenue was shared on the entire pool not only on a particular farmer's land. Because it became an indivisible pool, so wherever a bungalow was sold, 60 per cent was considered as the cost of land; wherever a constructed apartment was sold, 30 per cent was considered cost of land. This was to be divided proportionately among all the landowners depending on their shareholding.

This model also ensured that the farmer got the appreciation in property value in the township. In

the initial years, in 2003, the property in Magarpatta City was sold for about Rs 1,000 per square feet. In 2011, the same property was sold for Rs 5,000 per square feet. There has been tremendous land value appreciation. In year 2000, the land rate varied between Rs 30 lakhs and Rs 35 lakhs per acre. In 2011, it was worth more than Rs 3.5 crores per acre. In 12 years, there has been over 900 per cent appreciation in land value. This appreciation in property prices has come back to the farmers as dividends from the company as per the joint development agreement. The farmers have continued to receive this dividend as various properties on Magarpatta City have been developed over 12 years, starting 2000.

In addition, all farmers were encouraged to buy at least one residential property in Magarpatta City, to live there. Looking at the success of the township and from a point of view of saving taxes, member farmers ended up investing in multiple residential homes depending on their paying capacity. Roughly 400 flats are owned by farmer families and many are rented out. Many families have chosen to sell some of their properties to capitalize on the appreciation in property values and invested the money elsewhere.

A third important source of regular revenue is the IT park, owned by MTDCCL and leased to various companies, which ensures a regular rental income in perpetuity to the member farmers. In 2011, approximately Rs 23 crores was distributed as dividends to members. So there is continuous return even after the entire land cost comes back and they call it FDI – Farmers' Direct Investment. One of the biggest spinoffs of the whole scheme was the creation of a generation of entrepreneurs who are no longer dependent on the land. MTDCCL has subsidiary companies to run broadband, cable TV, the transportation system, food as well as landscaping, all owned and run by second-generation, self-employed landowner-entrepreneurs.

Giving back

The city of Pune has also benefitted from the development of a planned township like Magarpatta. The residential infrastructure was created for around 35,000 people. The IT park is fully occupied and operational providing employment opportunities for 60,000 people. The good income earned by the city had been enhanced by about Rs 150 crores per month. No concessions were taken from the

government during the construction of the project and Rs 57 crores has been paid to the Pune Municipal Corporation (PMC) as development charges to secure all permissions while Rs 2.25 crores is paid by way of average monthly property tax. The PMC earns Rs 25 crores per year from Magarpatta by way of taxes. The entire power and infrastructure inside the city is managed from within, generating employment for 1,800 people who are working in various departments in the campus. Magarpatta City has become a large construction company with equipment and capital assets. It has generated goodwill among the landowners. It has become a project execution company.

A City Council has been developed to ensure the participation of the residents of Magarpatta in the management of the entire project. One representative gets elected to the city council for every 75 units and 33 per cent of the seats are reserved for women. It has become akin to a mini corporation.

Farmers have assets that give them returns in perpetuity. This money has not only brought financial security, it has brought social upliftment too. It has made them proud. They are also working as vendors to the company. Their children go to good schools. Magarpatta's guiding vision, led by Satish Magar has been fairness, transparency, equity and inclusion. Everyone has prospered collectively, not a few at the cost of many, which is what makes the initiative sustainable. What started off as an initiative to protect their land has now grown into an enterprise beyond Magarpatta to Nanded, where the farmers have come together to build another dream. •

MASTER PLAN OF MAGARPATTA CITY

Source: http://www.magarpattacity.com/ accessed on 19 February, 2012

The author, an advocate, is associated with several non-profit organizations and is director of Business and Community Foundation (BCF).

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IFFCO KISAN SEZ - Nellore

Creating India's First Agribusiness Based Special Economic Zone

Realizing the need to bring in high value agribusiness activity into the country, **IFFCO, Asia's largest** fertilizer company through its SPV IFFCO Kisan SEZ Ltd., has embarked on the development of an **Agri-based Special Economic Zone based on the** concept of **"Agroparks" (AP) in Nellore** in the state of **Andhra Pradesh.** The developer has brought in the expertise and lessons learned by the northwestern European agro sector in **innovating metropolitan agriculture by forging strategic consultants with Wageningen University and Research** Center, the Netherlands and YES BANK Limited.

•IFFCO Kisan SEZ is a notified Multiproduct Special Economic Zone spread over 1000 hectares located 22 KM North of Nellore, A.P. It comes with many customs duty and sales tax concessions provided by the government of India to promote economic activity in notified Special Economic Zones. The concept of Agropark is based on the principles of sustainable development, i.e.

- Application of principles of industrial ecology, i.e. mutual use of waste and by-products.
- Advantages of scale through industrial production and processing.
- Improvement of farmers position as a preferred supplier.
- Independence from seasonality and land during the whole year of production cycle
- Significant reduction of costs

Locational Advantages: IKSEZ is at a distance of just 50 Km from Krishnapatnam Sea Port, a new mega port on the east coast, and within a reach of three hours drive from Chennai International airport.

Nellore, the catchment area which is the Heart of Indian Aquaculture, is a strong source of various agricultural produce such as paddy, sugarcane, fruits & vegetables (especially tomato) and is a prime source of supply of poultry products and milk to near by metropolis. Major fruits include mango, citrus, papaya, banana & sappota.

• Infrastructure that is being provided: The IFFCO Kisan SEZ comes with a bundle of world class common infrastructure conforming to international standards including internal roads, high quality rain harvest supported water supply, uninterrupted power supply, common operation, maintenance and management of security, logistics, ICT etc. Moreover, the Agropark offers a framework of industrial ecology, managing waste and byproducts thus significantly reducing costs.

• Land at IFFCO Kisan Project site is being offered on long term lease basis for 33 years for potential Entrepreneurs for setting up their units on attractive terms and conditions. For further details contact our website www.iffcokisansez.com or can be obtained from,

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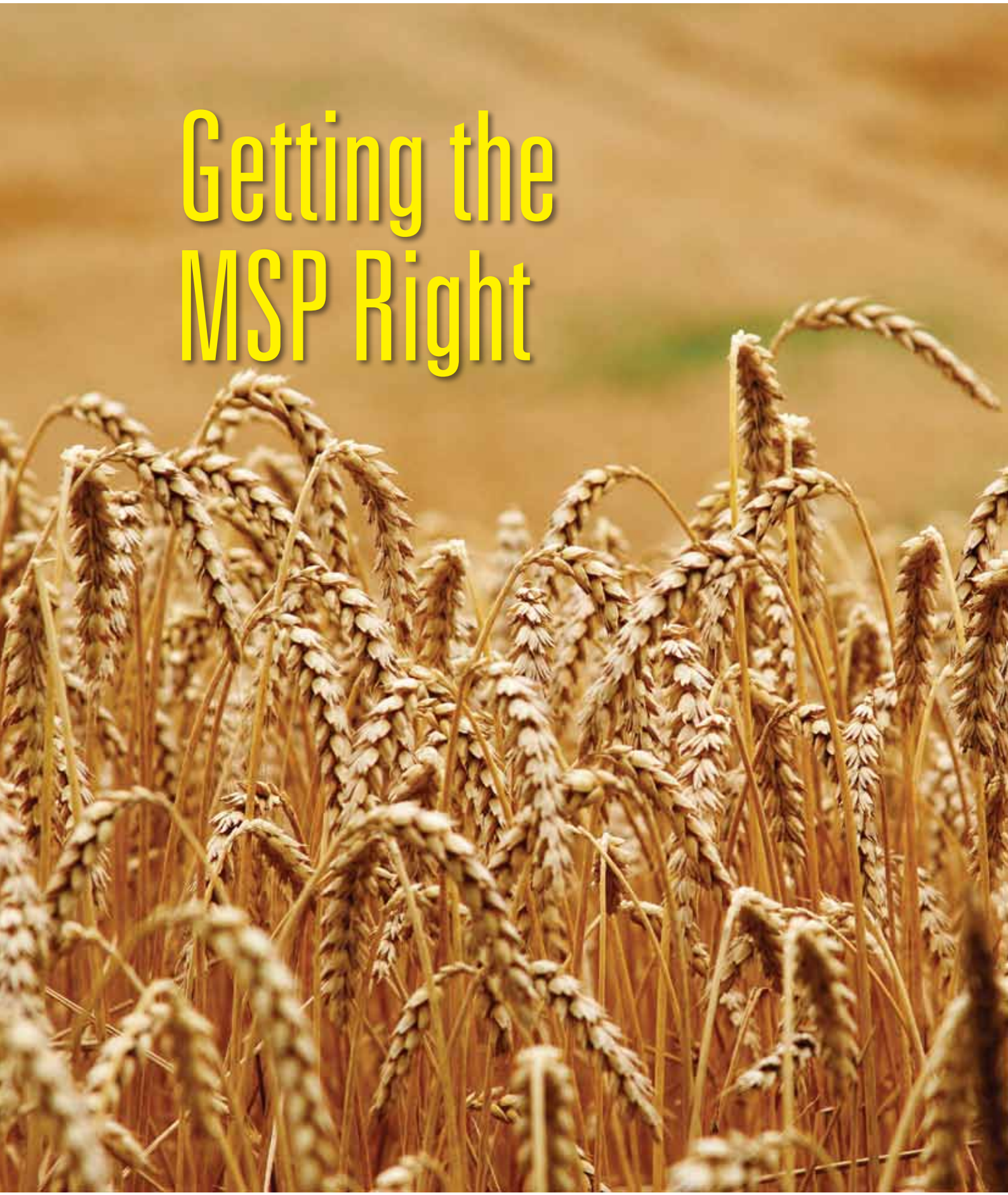
POINT OF VIEW

Getting the MSP Right



The All India Kisan Sabha (AIKS) has requested the Commission on Agricultural Costs and Prices to address the issue of fixing Minimum Support Prices (MSP) for Rabi crops keeping in mind the prolonged drought in many states, the doubts over a normal monsoon and the sharp rise in input prices.

Suggesting a sensitive approach to incentivize farmers to remain engaged in cultivation despite their economic hardships, the AIKS has suggested a contingency plan for the Rabi season should the rains be less than normal. This includes offering interest free loans, subsidized diesel, provision of rent-free pumpsets and tractors through the panchayats to encourage group cultivation and supply of quality inputs at affordable rates to help farmers deal with all eventualities.

The AIKS believes that the Minimum Support Prices (MSP) for Kharif crops, 2012-13 may have been higher but were neither "fair" nor "remunerative" given the hike in prices of all inputs. Also, "despite assurances that the overall cost of production will include the crop insurance premium paid by the farmers, marketing and transport cost incurred by them and apparent approval for the same by the government, it has just remained on paper. In 2011-12, the CACP had, however, conducted an exercise to calculate the cost of production inclusive of marketing, transportation and insurance premium (see chart 1) ", the AIKS says.

There has also been a sharp rise in fertilizer prices and the Department of Fertilizers has proposed a further hike of another 10 per cent in urea prices. "Moves are afoot to cut the subsidies for chemical fertilizers even further on the pretext of subsidizing bio-fertilizers. Unfortunately, the CCEA and the CACP have not factored in the exorbitant input costs while computing the MSP (see chart 2)".

Chart 1: Comparison of 2011-12 costs of production with 2012-13 MSP and C2+50% figures

Kharif Crop	Projected Cost of Production (C2) in 2011-12 (Rs/Qtl)	Modified Cost (C2+Transportation+ Insurance Premium+Marketing) 2011-12 (Rs/Qtl)	Projected C2+50% (Rs/Qtl) in 2011-12	MSP Announced for Kharif 2012-13 (Rs/Qtl)
Paddy	887.82	916.91	1331.73	1250
Maize	921.13	950.21	1381.69	1175
Bajra	839.89	882.60	1259.83	1175
Ragi	1271.46	1306.20	1907.19	1500
Jowar	1141.12	1173.07	1711.68	1500
Cotton	2528.37	2650.63	3792.55	3600
Groundnut	2633.18	2695.44	3949.77	3700
Urad	2798.93	2838.56	4198.39	4300
Soyabean	1560.22	1599.24	2340.33	2200
Sunflower	2795.10	2850.47	4192.65	3700
Nigerseed	2945.18	2970.22	4417.69	2500
Sesamum	3392.60	3463.36	5088.9	4200

Chart 2: Average Retail Price of Non Urea Fertilizers (Rupees/Tonne)

Non Urea Fertilizer	Price in Rabi Season	Price in Kharif Season	Percentage Increase
Di Ammonium Phosphate (DAP)	18,200	24,000	31.87
Muriate of Potash (MOP)	12,000	17,000	41.66
Single Super Phosphate (SSP)	4,800	7,800	62.50
NPK Complex (10:26:26)	16,000	22,000	37.5

Urging the CACP to take immediate steps for rectifying the anomalies and coming up with concrete suggestions rooted in the ground realities, the AIKA has put forward proposals for Rabi 2012-13 (see chart 3).

The AIKS has also asked for the price of jute to be fixed at Rs 3,000 for the common variety and Rs 3,500 for the superior variety and suggest ways of ensuring procurement at assured prices to provide relief to the distressed jute farmers.

As far as sugarcane is concerned, AIKS has collected the costs of production in Tamil Nadu, Andhra Pradesh, Karnataka and Uttar Pradesh (East & West) in 2010-11. The cost of production in Tamil Nadu was Rs 189.6/Qtl, in Andhra Pradesh, it was Rs 206.62/Qtl and in Karnataka it was Rs 204.34/Qtl. In western Uttar Pradesh it was Rs 245/Qtl and in eastern U.P. it was Rs 216/Qtl.

Chart 3 :

RABI CROPS	MSP Approved For 2011-12 (Rs/Qtl)	MSP Proposed by AIKS For 2012-13
WHEAT	1285	1900
BARLEY	980	1600
GRAM	2800	4500
LENTIL (MASUR)	2800	4500
RAPESEED/MUSTARD	2500	4000
SAFFLOWER	2500	3500

The AIKS says, if the MSP was calculated on the basis of the Swaminathan Commission recommendations, at the given costs, it would range between the lowest of Rs 284.4/Qtl to the highest of Rs 367.50/Qtl if western U.P. costs are taken into account. "This was based on calculation two years ago. The price fixed by the government on the basis of the CACP recommendations was only Rs 145/Qtl for 2011-12, which does not even meet the costs incurred

The Sugar Development Fund is entirely cornered by the industry. A part of it must be set aside to provide production incentives as well as insurance to sugarcane farmers to meet crop losses

by the farmer for production. Subsequently, there has been a further increase in cost of production and the prices must be fixed commensurately. Cost calculations from western Uttar Pradesh for 2012-13 show that it would cost Rs 317.90 to produce a quintal of sugarcane, including rent and transportation costs". Given these factors, the AIKS says that the "sugarcane price in any case must not be less than Rs 350/Qtl". Further, if sugarcane prices cannot be raised, the government should bring down costs.

The AIKS also refers to other unsavory practices in the industry. "The arbitrary fixation of recovery rate often much below the actual by sugar mills and complaints of fraudulent weighing of the produce are common. There is no verification of the sugar mills' claims on the recovery and weighing and there is no check or monitoring... Stringent measures should be taken to curb such practices. The byproducts like molasses, bagasse and press mud, which also bring earning to sugar industry are not taken into account while fixing the prices", the AIKS says.

Besides, the AIKS refers to the Sugar Development Fund that is almost entirely cornered by the industry. "Its flow is not equitable or beneficial for farmers". Urging that this be corrected, it says that "a part of it must be set aside to provide production incentives as well as insurance to sugarcane farmers to meet crop losses arising out of pests, natural calamities and accidents". Providing cheap credit to small and marginal farmers through this fund must also be explored. Besides, "the SDF must be used to disseminate production enhancing techniques at subsidized rates to farmers", says the AIKS. ●

Rewrite Pesticide Regulations to Revive Agriculture

Naresh Minocha

Photo: Eran Chesnutt

Prime Minister Dr Manmohan Singh wants top government functionaries to revive 'animal spirits' in the economy, implying that business confidence, reforms and growth should be put back in top gear. All such pep talk benefits or works for sectors and industries whose captains and liaison men rub shoulders with the powers that be.

For a change, can such efforts also be directed towards India's neglected sectors such as agriculture and the allied industries like pesticides, seeds and fertilizers? That the successive governments have made only half-hearted and disjointed efforts to reform and revive the agriculture sector as a whole is evident from the case of crop protection.

More than 12 years have passed since efforts were started to amend the Insecticides Act, 1968 or enact new pesticides legislation. At the start of each session of the Lok Sabha, the government religiously includes the Pesticides Management Bill (PMB) 2008 in the list of bills to be considered and passed. The Bill never sees the light of the day. In any case, the PMB, which was approved by the Parliamentary Standing Committee on Agriculture in February 2009, requires a through revamp.

The country desperately requires a framework that focuses on both the need for safer and effective use of pesticides and the urgency for breeding high-yielding crop varieties including the genetically-engineered ones. Amidst this current state of flux and uncertainty, the multiple problems ailing the pesticides sector and their combined adverse impact on farming continues to multiple.

The pesticides sector presents a bizarre picture. The existing regulations are so strict that they can land any good manufacturer in trouble if there are minor procedural lapses such as importing a pesticide from a different subsidiary of the parent group and not from the one mentioned in the import permit. The impact that this regulatory

Photo: Christa Richert

The law gives a free run to smugglers and companies importing pesticides under the garb of various chemicals to evade or pay lower duty or bypass import restrictions

constraint imposes is that the pesticides industry cannot resort to competitive sourcing of pesticides (technical grade) and its intermediates.

Ironically, certain other regulations under the outdated Insecticides Act are either lax or are enforced half-heartedly. The law is thus giving a free run to smugglers, dubious companies that import pesticides under the garb of various chemicals to evade or pay lesser duty or bypass the import restrictions. Similarly, the wheeler-dealers that peddle unapproved products, spurious/counterfeit products and adulterated or expired products have a good run.

The laws also forces many chemical companies to regularly go through the rigors of regulations just because they use chemicals that are listed as pesticides under a schedule to the Insecticides Act. The number of pesticides listed in this schedule stood at 820 as on May 25, 2011. About another two dozen chemicals are being inserted in this schedule following clearance of their inclusion by the Central Insecticides Board (CIB) at its last two meetings (See tables)

The number of registered pesticides, however, aggregated to 230 only as on June 17, 2011. The gap between the schedule and registered list shows that the untapped potential to provide farmers with diversified and safer portfolio of agrochemicals including bio-pesticides and plant growth regulators, is increasing.

There are a several factors that have hindered the tapping of this potential. These include regulatory, commercial and environmental issues and unresolved conflict between awarding innovations and encouraging production of cheap and copied formulations and promoting small enterprises.

Most of the dual-use or multi-purpose chemicals listed in the schedule are, however, not registered as pesticides. They thus cannot be legally used for plant protection. In any case, these are technical-grade pesticides or intermediates, which have to be processed into retailing form of products (formulations). The risk of these chemicals illegally finding their way into plant protection system is remote. (See: Regulation of dual-use chemicals imports trashes reforms)

The regulatory chaos ultimately hurts farmers who often end up spraying sub-standard or spurious pesticides suffering huge crop losses. It has deprived farmers of timely and full access to the latest generation of pesticides. The regulatory mess also breeds corruption and prevents companies resorting

Regulation of dual-use chemicals imports trashes reforms

What goes up; comes down. What goes in, however, remains inside forever. The Registration Committee (RC), the pesticides regulator under the Insecticides Act 1968, has used the latter logic to stonewall the chemical industry's plea to weed out from the statute the compounds that have never been used as pesticides in India.

At its meeting held on April 27, 2011, the RC lapped up an internal expert group's contention that "there is no provision under the Insecticides Act to remove the compounds from the schedule". The status quo logic is that a compound continues to possess pesticidial properties, whether or it is not used as s pesticide.

The RC says: As per the provisions of the Act, as well as by logic, a compound once included in the schedule, cannot be removed from it. Further, if these insecticides are removed from the schedule, the provisions of the Act shall not be applicable to them and these shall remain unregulated".

What about the thousands of hazardous chemicals that have the capacity to kill pests? Why have they not been added to the schedule? Are these chemicals not regulated by other laws?

Also, what about daily use chemicals, for example, water that too can kill insects? A water spray can kill several insects. Why it is still out of the schedule?

The RC has been tightening its grip over the dual-use/multi-use chemicals since 2005, sparking litigations and court interventions, forcing the customs authorities to issue a slew of internal instructions and public notices, hampering production at units that utilize such chemicals as raw materials.

Starting with regulating import of boric acid in 2004, the RC extended its statutory control over imports of all dual use chemicals. It did this under specific instructions of Department of Agriculture and Cooperation (DAC) issued on September 1, 2005.

The chemicals for which import permits are required from the RC include boric acid, a chemical with diverse applications, acrylonitrile, the building block for certain polymers and ethylene dichloride, the building block for a popular plastic. Other dual-use chemicals under the RC oversight are thiourea, barium carbonate, sodium cyanide, potassium cyanide, dichlone, copper sulphate and hydrogen cyanamide.

The industries that use dual-use pesticides to manufacture diverse products include glass, ceramics, petrochemicals, dyes, leather, metals and pharmaceuticals. The RC symbolizes the re-emergence of the dreaded licence raj, during which the authorities decided which company should import a product in what quantity and from which source.

The RC's penchant to lord over imports by the chemicals industry has invited ridicule from different quarters and strictures from the high courts. A U.S. Trade Representative's review of India's foreign trade prepared in 2007, for instance, stated: "India may be the only country that requires registration of boric acid intended for non-insecticide use. U.S. industry is required to register, although 90 per cent of all boric acid imports into India are for non-insecticide uses (such as glassmaking) and should qualify for an exemption. India's boric acid producers are not subject to the same requirements. The U.S. government has raised this issue with the GOI on numerous

occasions but India has taken little action to address the concerns except to web-post general contact information indicating which ministries are responsible for issuing no-objection certificates to import non-insecticidal boric acid, based on the end use of the product".

If one extends the U.S. contention, one finds that the RC does not all regulate indigenous manufacture of all dual-use chemicals, the imports of which are regulated with amazing scrutiny and rationing. The RC even allows lesser imports than required, in spite of favourable recommendations available in the RC minutes as well as in some of the orders issued by the high courts where aggrieved companies have highlighted their plight.

List of 14 new pesticides cleared by the CIB for inclusion under IA

S. No.	Common Name	IUPAC/Chemical Abstract Name	CAS No.
1.	Theta-Cypermethrin	[1α(S*),3β]-(+)-cyano(3-phenoxyphenyl)methyl 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate	RN [71697-59-1]
2.	Pyroxasulfone	3-[(5-difluromethoxy)-1-methyl-3-(trifluromethyl) pyrazol-4-ylmethylsulfonyl]-4,5-dihydro-5,5-dimethyl-1,2-oxazole	447399-55-5
3.	Pyrifluquinazon	1-acetyl-1,2,3,4-tetahydro-3-[(3-pyridylmethyl)amino]-6-[1,2,2,2-tetrafluoro-1-(trifluoomethyl)ethyl]quinazolin-2-one	337458-27-2
4.	Cyenopyrafen	(E)-2-(4-tert-butylphenyl)-2-cyano-1-(1,3,4-trimethylpyrazol-5-yl)vinyl 2,2-dimethylpropionate	560121-52-0
5.	Prohexadione Calcium	Calcium 3-oxido-5-oxo-4-propionylcyclohex-3-enecarboxylate	127277-53-6
6.	Saflufenacil	(N'-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)3,6-dihydro-1(2H)-pyrimidinyl)benzyl]-N-methylsulfamide)	372137-35-4
7.	Fluxapyroxad	3-9difluoromethyl)-1-methyl-N-(3',4',5'-trifluorobiphenyl-2-yl)pyrazole-4-carboxamide	907204-31-3
8.	Etoxazole	(RS)-5-tert-butyl-2{2-(2,6-difluorophenyl)-4,5-dihydro-1,3-oxazol-4-ylphenetole	153233-91-1
9.	Bistrifluron	1-[2-chloro-3,5-bis(trifluoromethyl)phenyl]-3-(2,6-difluiorobenzoyl)urea	RN [201593-84-2]
10.	Flupyradifurone	4-[(6-chloro-3-pyridylmethyl)(2,2-difluoroethyl) amino]furan-2(5H)-one	951659-40-8
11.	Beflubutamid	(RS)-N-benzyl-2-(α,α,α,4-tetrafluoro-m-tolyloxy)butyramide	113614-08-7
12.	Flutolanil	α,α,α-trifluoro-3'-isopropoxy-o-toluanilide	66332-96-5
13.	Nitenpyram	(E)-N-(6-chloro-3-pyridylmethyl)-N-ethyl-N'-methyl-2-nitrovinylidene diamine	120738-89-8
14.	Pyriftalid	(RS)-7-(4,6-dimethoxypyrimidin-2-ylthio)-3-methyl-2-benzofuran-1(3H)-one	135186-78-6

(Source: Minutes of the CIB meeting held on November 28, 2011)

The CIB and the RC under the Insecticides Act have been fiddling with critical issues for several years without arriving at any concrete results

to competitive sourcing of raw materials. The CIB and the Registration Committee (RC) under the Insecticides Act have been fiddling with these issues for several years without arriving at any concrete results.

One can fathom the hopelessness of the situation by elaborating the subject of pesticides smuggling, mis-declaration of imported consignments and marketing of such products. This issue has been cropping up at RC meetings and other government-organized fora for many years.

Way back, on April 1, 2003, the RC, for instance, discussed the issue dubbed as 'Prevention of illegal import of sub-standard pesticides from unauthorized sources'. According to the minutes of this meeting: "The committee deliberated the agenda in detail and noted the order of the Appellate Authority (Joint Secretary-Plant Protection in Agriculture Ministry) and decided to rescind the cancellation orders, withdraw the letters issued to the State Govts./UTs for cancellation of the manufacturing licences..."

The issue again figured in the RC meeting on May 27, 2004 in which the report of an experts' committee on faster registration of pesticides and proper enforcement of the Insecticides Act was discussed.

The committee recommended: "In so far as smuggling of pesticides is concerned, it comes within the domain of police and customs authorities. For checking import from unauthorized sources, RC needs to be equipped with the power to suspend and cancel registration certificates and therefore, it calls for amendment of the Insecticides Act, 1968 accordingly".

On this, the stance of the Department of Agriculture and Cooperation (DAC) was that "the registration, once granted, though cannot be cancelled, the Insecticides Act, 1968 provides for action and instituting legal proceedings. Prosecution is possible under Section 29. If exemplary action is taken under the watch of media, this nuisance could be curbed. Since prosecutions take time, state could at least cancel the license of such persons..."

The RC is extremely wary about making voluntary disclosures about its working; it certainly does not

Substances for Inclusion in the Schedule

S. No.	Name of the applicant (M/s)	Common Name	IUPAC/Chemical Abstract Name	CAS No.	Bioefficacy
1.	Meghmani Organics Limited, Ahmedabad (3-6/2012-CIR-II)	Zeta Cypermethrin Technical	(S)-cyano(3-phenoxyphenyl) methyl 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate	52315-07-8	Insecticide
2.	Cheminova India Ltd., Mumbai (3-5/2012-CIR-II)	Florasulam	2',6'8-trifluoro-5-methoxy[1,2,4] triazolo[1,5-c]pyrimidine-2-sulfonanilide	145701-23-1	Herbicide
3.	Bayer CropScience Ltd., Mumbai (3-14 /2012-CIR-II)	Triafamone	N-(2-[4,6-dimethoxy-1,3,5-triazin-2-yl)carbonyl]-6-fluorophenyl]-1, 1-difluoro-N-methyl methanesulfonamide	874195-61-6	Herbicide
4.	BASF India Ltd., Mumbai (3-8/2012-CIR-II)	Difenacoum	(RS)-1-methyl-2-nitro-3-(tetrahydro-3-furylmethyl) guanidine	165252-70-0	Rodenticide
5.	Nirmal Seeds Pvt Ltd, Pachora (Jalagaon), M.S. (3-18/2012-CIR-II)	Bacterial Extract (Physiological Extract of Bacteria and species of Blue Green Algae) Glutamic Acid Content is proposed as 'Marker'.	Extract of bacterial species viz. Bacillus subtilis, Pseudomonas straita and Azotobacter crccomum with extract of Species of Blue Green Algae "A. platensis".	617-65-2 (Glutamic Acid)	Plant Growth Regulator
6.	BASF India Ltd., Mumbai (3-17/2012-CIR-II)	Profoxidim	(EZ)-2-{1-[(2RS)-2-(4-chlorophenoxy) propoxyimino]butyl}-3-hydroxy-5-(cis-thian-3-yl) cyclohex-2-en-1-one.	139001-49-3	Weedicide
7.	East coast Seaweed Inc, Thirumangalam, T.N. (Ref. Directions in the W.P. No. 10009 of 2012 alongwith M.P. No. 1&2 of 2012 by the Hon'ble High Court of Judicature at Madras)	Brassinolide	(3aS,5S,6R,7aR,7bS,9aS,10R,12aS, 12bS)-10-[(2S,3R,4R,5S)-3,4-dihydroxy-5,6-dimethyl-2-heptanyl]-5,6-dihydroxy-7a,9a-dimethyl-hexadecahydro-3H-benzo[c]indeno[5,4e] oxepin-3-one.	72962-43-7	Plant Growth Regulator

(Source: Minutes of the CIB meeting held on May 30, 2012)

want to bring under media glare the ugly and soft underbelly of the pesticides business. Accepting the DAC's decision, the RC had then sought legal empowerment to cancel registrations for violations of conditions mentioned in registration certificates. The fact is that there is hardly any monitoring of conditions stipulated in innumerable registration certifications over the years!

The menace of illegal imports and marketing of unapproved/subs-standard products/spurious products again figured at a special meeting convened by the RC on May 26, 2005.

To quote from the minutes of the meeting: "Associations informed that several products are being sold to the farmers under fancy names such as 'growth promoters', 'plant protectors', etc. Their source of supply, contents, compositions, etc are unknown. As such, these are not registered. Their use is a serious risk to the farmers. It was proposed that the government of India should direct states to conduct frequent checks, get sample analyzed and hand out severe punishment to those selling unsafe products. This will help in dealing with unscrupulous players and compel suppliers to obtain registration in case their product contains pesticide(s). This will also encourage selling of only quality products. The participants were informed that the joint secretary (PP) has already addressed a letter to all the states in this regard".

Concern over the issue of illegal imports and marketing malpractices has also been voiced by other panels. A case in point is the government-constituted task force on plant protection that mooted reforms in 2007. It noted: "much of the import trade in technical grade pesticides is not subject to effective control. In some cases, low quality (impure) technical grade pesticides are imported; in others precursors are imported, labeled

as general chemicals rather than pesticides (to attract lower rates of duty)". The task force also observed that: "pesticide misbranding (usually the sale of under-strength formulations) is thought to be quite widespread, confirmed by the sampling and testing at state and national pesticide testing laboratories".

The CIB also chipped in on the matter of illegal imports at its 41st meeting held on May 29, 2009. It noted that: "some pesticides are being imported in the country in the name of chemicals and intermediates, etc., which are not registered under the Insecticides Act. To restrict this import, Ministry of Agriculture, may be requested for listing of such chemicals in collaboration with Custom Department by constituting a technical group and afterward Custom may be advised to clear the listed chemicals for import after clearance/ NOC (no objection certificate) from CIB&RC".

In that meeting, the CIB focused on specific cases of "imports of pesticides by traders without proper registration from the Central Insecticides Board and by suppression of actual common name and mis-declaring as Industrial Chemicals at Chennai". A year later, the CIB had made no headway on this. As the minutes of the CIB meeting held on May 26, 2010 put it: "Since no response from the Custom Authority, Chennai was received and being a policy matter, the Department of Agriculture and Cooperation may be requested to constitute a fact finding team comprising

Pesticides Management Bill 2008: old wine in new bottle

Pests might not have become fully resistant to pesticides. The Union Agriculture Ministry is however, resistant to reforms at least when it comes to giving up its powers. It wants to retain, in-house, all powers to regulate the pesticides industry, while many ministries have transferred powers to govern different sectors to independent, statutory regulatory authorities.

The Pesticides Management Bill (PMB) 2008 is an old wine in a new bottle continuing with the same regulatory structure as exists today under the archaic Insecticides Act 1968.

- Under the proposed bill, the Central Insecticides Board (CIB) becomes the Central Pesticides Board (CPB) while the Registration Committee retains it present name.
- The PMB also provides for an appellate authority without specifying its profile as is the case with the Insecticides Act.
- An obscure fact is that the joint secretary (plant protection) doubles as the appellate authority as at present.

This is a far cry from the independent regulatory system in which the appellate authority normally comprises three members, one of whom is a retired High Court judge. Such independent, statutory regulatory authorities, despite their flaws, are better than in-house regulators of the ministries. The former normally issues consultative papers and takes views of all stakeholders before finalizing its recommendations. The question is, has the Registration Committee ever consulted farmers before approving any new registration of pesticides, leave aside the public at large.

Now that the PMB has suffered an inordinate delay, there is no harm in amending it as the PMB 2012 and providing for an arms' length regulatory-appellate framework. The government can do this in the monsoon session after moving the Bill in the Lok Sabha. Such an approach would avoid delay. It only has to muster the political will.

The PMB is a scale-up variant of the amendments to the Insecticides Act that were unveiled by the Agriculture Ministry in 2001. The amendment bill was never introduced in Parliament and was later aborted in favour of framing a new law, the PMB. The government marginally amended the Insecticides Act only once, in 2000 to revise certain provisions relating quality control, including punishment.

- The government should move changes to the PMB taking into account suggestions and concerns from different quarters.
- The changes could include recommendations made by the Parliamentary Standing Committee (PSC) on Agriculture in its report on on the PMB in February 2009.
- The PSC, for instance, recommended the inclusion of two farmers' representatives on the CPB.
- If an independent regulatory structure is adopted, there would be no need for a CPB.

In that case, the government should not hesitate to appoint a progressive, educated farmer as member of the five-member regulatory authority. The other members can be from agricultural sciences, medical, environment and pesticides professions.

officers of Sectt. of CIB&RC with a clear mandate to find out the details of the traders and the modus operandi adopted by them to import pesticides without proper registration and how these spurious pesticides are distributed in the market".

The subject of illegal imports also figured at the Agriculture Ministry-organized open house on 'Problems Faced by Pesticide Industry in the process of registration of pesticides' held on May 19, 2010. As the minutes of the discussions said: "Considering the sensitivity, danger and illegal activities it was decided that a suitable proposal may be submitted by Pesticides/Bio-Pesticides Industry Associations for curbing this menace for further necessary action at appropriate level".

A policy paper on agrochemicals, published by the National Academy of Agricultural Sciences in 2010, has suggested that the government act effectively against "illicit trade in the products of doubtful origin". It has advocated that "claims (made) through tailored analysis reports, false label information, duplicate labels, etc. may be treated as serious offences".

The latest take on this illegal imports business is that the RC decided on June 8, 2012 to constitute a group of three experts to analyze the matter and submit the report to the RC in its next meeting.

Thus from April 1, 2003 to June 8, 2012, the government has been moving in circles on the issue of illegal imports and the subsequent illegal marketing of pesticides. To be fair to the government though, it has been subtly handling this problem through improved coordination with the customs authorities and prodding the states to step vigilance on pesticides markets. Simultaneously, it has been including more pesticides in the schedule to the Insecticides Act, a move that should theoretically discourage illegal imports in the long run.

The government has also realized that it should shed it reservations on allowing introduction of combination products. At its last meeting held on May 30, 2012, the CIB set a timeline for a panel constituted in November 2011 to recommend requirements for inclusion of the combination products in the schedule to the Act.

Such efforts are, however, drop in the ocean. The government must usher in winds of reforms in the plant protection arena in particular and entire domain of agriculture in general. It needs to fix the reforms agenda, starting with a consultative paper on pesticides and genetic engineering of pest-resistant varieties and ending with the passage of requisite legislations within one year.

It is time Manmohan Singh proves that he means business. ●

Anirban with his 'no-pesticide' plants

Photo: Dhrubajyoti Ghosh

Vegetables, and Truly Green

Dhrubajyoti Ghosh

In 1962, exactly 50 years ago, Rachel Carson shook the world with her Silent Spring, not just sensitizing the world about the ongoing devastation of ecology and ecosystems but, arguably, giving birth to 'environmentalism', as a new area for activism and intellectual attention. The focus of Rachel Carson's research was the crisis in agriculture caused by overuse of pesticides. Commemorating the 50th anniversary of the publication of Silent Spring, Rob Dunn reminded in 'Nature' (Volume no. 485, May 2012) that: "it was the misuse of DDT that had provoked Carson to action". He also said that: "the agro-chemical industry spent hundreds of thousands of dollars to fight the book's message".

Since then barons of agri-business have left no stone unturned to diffuse the perceptions about the impact of their business. These leaders of capital and finance have invaded every environmental cause with their 'support', from the Stockholm Conference to other important environment-related conferences since 1972. Policy makers from across the world, 'leading' environmentalists and political luminaries attend such conferences in exotic places to debate the state of the 'environment'. Agro-chemical makers spend humungous amounts to confuse and derail the focus of environmental movements and research. Even in India, despite the vociferous pro-environment movement, very little has happened to effectively curb the phenomenal increase in use of agro-chemicals and pesticide use since the 1970s in the name of green revolution.

Yet there are efforts across the country that go against the tide and act to honour the memory of Rachel Carson. There are small efforts all over to produce safe food, free from the ill effects of pesticides and agro-chemicals. Often these heroic efforts get lost in the rough and tumble of everyday life and reporting.

On a sweltering and uninviting afternoon in May, I chanced upon one of them in the heart of South Calcutta: on the rooftop of Anirban Chanda's office. Anirban is a first-generation entrepreneur specializing in aquaponics on his 90 square meter vegetable garden. Rooftop gardens are not exactly rare; in the metropolises of India, one in a thousand roofs may sport such gardens; green apartments sport them as a part of their unique selling proposition. Anirban's garden is unique, possibly the only one in this country that displays a variety of aquaponic systems and boasts of an amazing ensemble of seasonal vegetables. Tomatoes, cucumbers, bitter gourds, bottle gourds, kohlrabi, cauliflower, cabbages, red and green spinach, chillies, capsicum, cherry, basil, green beans, brinjal, ridge gourds, pumpkins, lettuce, turnips, papayas and several seasonal flowers and herbs.

He breeds fish on his rooftop as well: Telapia and Magur that share a symbiotic relationship with the plants are bred there. What sets the garden apart from usual rooftop greens is that its systems use less water than traditional land gardens, require much less man hours for being tended to and grow vegetables in greater density than a traditional soil-based garden. Anirban says that the systems are "appropriately Indianized, hand made and cost less to build and run than most other aquaponic systems available worldwide.

It has taken Anirban about three years to develop his garden producing vegetables without any pesticides or agro-chemicals, using aquaponics, which is a symbiotic combination of organic aquaculture and hydroponics. Simply put, it is about growing fish and plants in a symbiotic system. Anirban rears fish in tanks to generate ammonia that is filtered to keep them alive. The aquaponics here involves a closed system, substrate-based bio-filtration technique to remove ammonia by using nitrification bacteria to convert ammonia into nitrites and nitrates that are provided these to plants (vegetables). What results is an organically grown product that needs no soil while the clean water is returned to the fish tank closing the cycle. Anirban's aquaponic system produces both edible fish and organic vegetables at the same time symbiotically.

Anirban was motivated to assemble this rooftop phenomenon courtesy:

- spiralling food cost
- undesirable genetic modifications of produce
- indiscriminate use of chemical fertilizers and pesticides for growing crops and
- increasing shortage of clean, uncontaminated agricultural land and high and fluctuating prices of vegetables.

Agro-chemical makers spend humungous amounts to confuse and derail the focus of environmental movements and research Tis aute debisciat. Nam ium qui

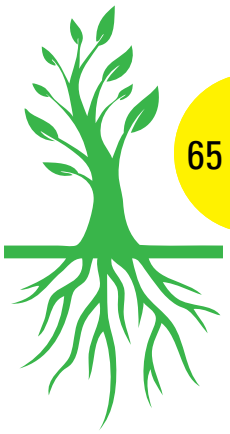


Photo: Dhrubajyoti Ghosh

Vegetables growing without soil

Anirban uses stonechips as substrate because stonechips are cheap and easily available. Black stonechip is beneficial for the bacteria that is light sensitive. While experts say that hydroton (leca) is the ideal medium, it is almost five times more expensive than the gravel). Some countries use lava rock. Anirban adds no nutrient: "No chemicals at all". The only things he adds to the systems "is oxygen via an air pump if required, food for the fish (mainly Telapia and Magur), earthworms to the grow bed to mineralize solids and keep the root systems clean and water top ups as required". The plants draw nutrition from the converted ammonia rich fish waste and leftover fish food converted by nitrifying bacteria and well oxygenated water. The fish feed comprises duck weed, black soldier fly larva and fish food that we make ourselves.

While the economics of the project has not been professionally worked out, the arithmetic is clear in Anirban's mind. A single unit requires less than 10 minutes a day of maintenance, fish feeding requires less than a minute, a once-in-three days maintenance schedule requires about 15 minutes. One full time person is enough to look after an area of about 45 sq metre easily with time to spare and some occasional help and it needs no tillable land.

Aquaponics can also use vertical spaces very effectively and does not require any investment on fertilizer or pesticide. Water is lost only in evapo-transpiration. Very importantly, a large benefit accrues courtesy averting healthcare costs. People in cities and villages have been suffering from pesticide and fertilizer impacted diseases and research in these areas is systematically blocked. Anirban expects that cost of installation (Rs 4,000 to Rs 5,000 per square metre) can be recovered in five years, while operating profits are reached within first cycle of crop and are likely show greater profitability than soil-based ventures in the same area.

Kolkata is now on a beautification spree. A number of plans are being implemented especially on the riverside. What if 50 per cent of the city rooftops go green in the Anirban way? "Hanging Gardens of Babylon! I can not even begin to list: fresh clean food grown everywhere, increase in fish in the diet, less methane generating meat consumption, abundance and availability of organic produce, help remove the premia on organic produce, lower food prices and lower control by food mafias, less stomach-related ailments, greenery, more oxygen, less lung-related ailments, lower micro climatic pollution, healthy biodiversity (small birds and insects), lower radiating heat from rooftops, cooler homes (and lower electrical consumption thereof), lower food miles, less dependence on carbon fuel transport for food, it will discourage current unsustainable agricultural techniques in vegetable production. I envisage a dent in our carbon footprint as a city and a marked improvement in the health of future generations".

Surely a consummation devoutly to be wished; one that Anirban Chanda pursues through disbursement of information through a website. Learn, get trained and procure a self-help system for a green roof. Cherish Rachel Carson. ●

The author is a U.N. Global 500 Laureate and Regional Chairman, South Asia Commission on Ecosystem Management, IUCN

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