

INDIA CAN BEAT THE FOOD CRISIS

Dr Suman Sahai
Convenor, Gene Campaign

Gene Campaign is of the view that the current food crisis is beatable and that with some intelligent planning, India can not only remain self sufficient in food but can also become a food surplus country.

Institutions and Systems

It is cause for worry that at this time of crisis, the country is saddled with a system of agriculture research and implementation that is ineffective and unable to rise to the challenge posed by the food crisis.

The first step to tackle the food crisis will be to radically overhaul institutions like the Indian Council of Agriculture Research (ICAR), Agriculture Universities and the food distribution systems. It is disappointing that the agriculture scientific community has so far made no statement nor revealed any plans on how it proposes to tackle the impact of climate change on agriculture.

Fresh blood needs to be inducted to make agriculture bountiful in today's challenging situation. A radical new approach and fresh plans are needed which include the perspectives and experience of a range of stakeholders who are seldom consulted in agriculture planning. These should include experts in diverse fields like water conservation, ecology, pest control, genetics and plant breeding working in formal institutions and Civil Society Organizations (CSOs).

Indigenous Knowledge must be tapped and combined with formal science to find solutions and to create new opportunities. For instance, Gene Campaign has developed plant based pesticides for the major crops in Jharkhand, based on the knowledge of Adivasi communities.

Climate Change and agriculture

The most serious long-term challenge facing Indian agriculture is global warming and Climate Change. According to all estimates, agriculture in South Asia will be the worst affected by global warming.

- Climate change could cause irreversible damage to land and water ecosystems and lead to loss of production potential.
- Heavy and variable precipitation, heat waves, cyclones, droughts, and floods likely to be more frequent and intense, resulting in greater economic shocks.
- Policymakers must cope with an increased risk of frequent shocks to their economies, which will affect the most vulnerable populations.
- Remedial and adaptive steps need to be put in place immediately to enable Indian agriculture to cope with anticipated changes.

The injustice of Climate Change: those countries that have polluted and caused Climate Change will be the greatest beneficiaries of its impacts.

• *Developed countries will experience increase in productivity; one crop becomes two crop zone causing doubling/even trebling of food production*

- In *developing countries* the predicted losses could be as high as 23 % of current crop production
- In developing nations the loss of potential cultivatable areas is mainly in double- and triple-cropping areas, two crop zones become single crop zone

What we should do

- Compile meteorological data for last 100 years to detect trends in temperature variation and rainfall amount and pattern
- Combine local and global assessment to make projections for one crop, two crop, two-three crop zones
- Calculate potential land loss to aridity / desertification / sea incursion;
- Develop zone wise strategies to make up for loss in agriculture production

Wheat replacement

It is clear that India will suffer a major setback in wheat production as global warming increases. Wheat productivity, which is critically dependent on cold night temperatures, will suffer as temperatures rise

- Develop strategies for *crop substitution* where needed

Wheat displacement – with millets, tubers like potato, yams and cassava

- Start multiplying seeds and other planting material right away so that there is enough planting material for the new crops when the season begins
- *Diversify food basket* – bring forgotten and neglected foods like millets, yams, leafy green vegetables and other underutilized crops into cultivation and onto the market. Most of these were developed as “famine foods” by rural and tribal communities to tide them over bad weather conditions when other crops fail. These crops are hence adapted to do well in sub optimal climate conditions. They could be valuable crops today.

Water Conservation on war footing

Watersheds are important to recharge groundwater but to increase agriculture production in the shorter term, the farmers need to access the water for the winter crop. This means we need to:

- Conserve every drop of water where it falls; develop local water bodies like low cost ponds and wells at household & village level
- Strictly regulate ground water extraction and get a rational water use policy giving preference to farming.

Only 30- 35 percent of India’s agriculture land is irrigated. Every drop of rainwater should be conserved in farm ponds and wells at household and village level to make water available for a second winter crop. If this done effectively, using schemes like NREGA, food production can be at least doubled.

Biofuels vs Food Security

India has begun biofuel programs and its draft policy proposes to start with a blending proportion of 5 per cent (5 % biofuel with 95% petroleum) by 2012, 10 per cent by 2017 and over 10 per cent after 2017. This must stop. India must get off the US led bandwagon of biofuel and its politics and devote itself to producing as much food as possible

The *Jatropha* species being used in India, *Jatropha curcas*, is low yielding, giving one ton of seeds per hectare under optimal conditions. With a seed price of Rs 5 per kg, the farmer would make only Rs. 5,000 per hectare per year. This makes it a loss making venture. Research that shows that biofuels give out less energy when burnt than was used in their manufacture. 6,597 kilocalories of nonrenewable energy are required to produce a liter of

ethanol from corn, which contains only 5,130 kilocalories of energy. This is a 22 percent deficit.

Studies (OECD) suggest that even if high yield bio-energy crops were grown on all the arable land on earth, the biofuel produced would cater to only 20 per cent of our current demand. On top of this, biofuels are more expensive than petrol. At present, this difference is covered by subsidies.

The vocal 'biofuel lobby', argues that bio energy crops to produce agro fuels would only be grown on degraded or wasteland, not fertile land. This is pure myth. Any biologist will tell you that in order to produce a healthy plant yielding useful products, that too high value products like oil, the plant needs to be fed and watered carefully. This means putting in optimal fertilizer doses and adequate irrigation. Without this, *Jatropha* will not produce enough oil to make it viable.

Second, if the 'wasteland' is capable of supporting *Jatropha* cultivation, should it not be used for the cultivation of food crops like cereal, legumes and oilseeds, or if not that, then fodder grasses? India and all of South Asia have large livestock populations, which serve as additional support for local food security. The region is deficient in fodder and all kinds of non-arable land should be diverted to fodder grasses, not crops to produce agro fuels.

Ethics and equity in biofuels

There is an ethical dimension to the biofuel story, and a question of equity. On the one hand are the poor whose right it is to be fed and the nation is bound to do its utmost to produce the maximum amount of food it can, to end endemic hunger and poverty. Yet we are diverting land that can produce food for the poor. The Biofuel strategy essentially means taking land away from food needed by the poor to produce fuels that will be used by those who own and drive cars.

An FAO- OECD report predicts that the current fad of biofuels will take land out of food production and increase the price of agriculture commodities. The report anticipates that this will lead to a rise in food prices over the next ten years. While higher food prices will be profitable for food exporting countries and large farmers they will threaten the economies of food importing countries, the livelihoods of their farmers as well as the food available to the urban poor in these countries.

The US led biofuel program is a red herring drawn by a country that refuses to comply with the Kyoto Protocol, to cut emissions, to bring in energy efficient cars to replace its gas guzzling sedans and SUVs, to cut back petroleum consumption, to expand public transport. It has put up the red herring of biofuels to distract from its terrible track record on global warming, to pretend that it is concerned about the environment. Other countries must see through this deceit and suspend their biofuel programs in favor of alternative energy sources like hydrogen based fuels, solar, wind and geothermal energy. There is no getting past reducing consumption of petroleum-based fuels either.

GM Crops and food security

The food crisis seems to have given an upwind to the GM industry which has sharpened its rhetoric that food security cannot be met without GM foods. The first question is, where are the GM crops that will fight global hunger? Which crops are available that will increase crop production and bring in higher levels of nutrition? What role does Bt cotton, play in increasing the availability of food? Will the food crisis be solved by Bt Brinjal and Bt Okra, waiting in the wings to enter farmers' fields?

The high point of this absurd and baseless posturing comes in the shape of a 'scientific breakthrough' from Jamia Hamdard in Delhi that has succeeded in breeding strawberries for

salt tolerance! In this time of food crisis (and at any time really), the Biotech lobby is investing in crops as frivolous as strawberries and yet they talk that food security can only come from GM crops!

The biofuel bandwagon is also promoted by the GM corn lobby... 'grow more GM corn ...produce more biofuel'. A similar tack is beginning with GM sugar for ethanol as fuel. Promoting GM crops for biofuels also shows up the hypocrisy of the biotech lobby that does not tire of making the point that GE crops are necessary to produce more food for the growing world population.

They make the case that relying only on natural crop varieties would create food deficits and lead to forests being cleared for cultivation, to meet the burgeoning food demand.

Yet the same companies think nothing of diverting limited agricultural land to produce crops, not to support food security, but to produce agro fuel.

The way for India

India can emerge as a food sufficient and food surplus country if it acts right.

The high global prices of food are going to stay because they are directly connected to the price of oil, which does not appear to be coming down any time soon. Western agriculture is expensive because it is heavily dependent on petroleum fuels. It is entirely mechanized and chemical intensive. Most fertilizers and feedstock are based on naphtha, a petroleum product.

In India agriculture is labor intensive, not mechanized, hence less dependent on petroleum. Chemical fertilizer use is supplemented with bioorganic nutrients. Groups like Gene Campaign are spreading the use of composts like vermicompost, Blue – Green algae and other biofertilisers that maintain soil health along with adding nutrients.

Agro biodiversity conservation and Seed Banks

It has been understood for some time now that genetic diversity is the key to maintaining sustainability in food production. This truth is underlined ten times over as we face global warming and climate change when micro and macroclimate will fluctuate and crop production zones will change. The only way to breed new crop varieties for the changed situation is to go back to the genetic diversity of crops and look for genes suited to the new situation. Genes for instance, for drought tolerance in cold temperatures or drought tolerance in hot areas? Resistance against fungal diseases? Or sucking pests or insects, which were not know earlier? Coping with all this will need access to a variety of genes.

To tackle the food crisis, genetic diversity must be maintained in crop varieties, livestock, forest species, aquaculture, and most of all, in the soil. Soil biodiversity is essential for sustained good yields.

India is rich in crop genetic diversity because our farmers maintain several hundred species of the same crop. Despite the Green Revolution, significant diversity is still available. This must be conserved. Other than the National Gene Bank, the govt is not doing much in this regard but civil society should take this up on a war footing to create a huge pool of genetic wealth that can be tapped to breed new varieties.

Gene Campaign's efforts

Realizing the crucial importance of genetic diversity to long term food security, Gene Campaign has been setting up Seed- Gene Banks of traditional crop varieties in the villages of Jharkhand and Uttaranchal since the past few years. Jharkhand already has 10 such banks, with a total collection of over 2000 crop collections, chiefly rice. More farmer level banks are being set up every year.

The way ahead for India is to invest heavily in setting up field level Gene-Seed Banks to

- Conserve all available genetic diversity of crop plants, specially food staples like rice . India is the birthplace of rice and several other important food crops , vegetables and legumes.
- Maintain a seed source of locally adapted seeds accessible to farmers.
 - Characterize the properties of all the varieties so that plant breeders can use these properties/ genetic traits to breed new crop varieties for the changed situation, like drought and salinity tolerance and tolerance to high temperature, resistance to diverse pests and high yield.

Dr Suman Sahai
Gene Campaign

Regd. Office- New Delhi
Gene Campaign , J-235/A, Lane W-15C, Sainik Farms, Khanpur, New Delhi - 110 062, INDIA
Ph. +91 11 29556248, Fx. +91 11 29555961; Em. genecamp@vsnl.com; Web. <http://www.genecampaign.org>

Regional Office:- Jharkhand
Gene Campaign; Adivasi Colony, Rameshwaram, Near - Army School, Booti Road, Ranchi-834009,
Jharkhand.
Ph. - +91 651 2545016; Em. gcjharkhand@gmail.com

Regional Office - Uttaranchal
Gene Campaign; Orakhan, Dist. Nainital, Uttaranchal
Em- mail@genecampaign.org

Regional Office – Uttar Pradesh
Gene Campaign- UP
Tilhar, Dist. Shahjahanpur, UP
Em- mail@genecampaign.org