

ONE INDIA ONE PEOPLE

Patriotism Redefined



Is opposition to GM just
fear mongering?

Saree trials

Food so foul

The bogey of food security!

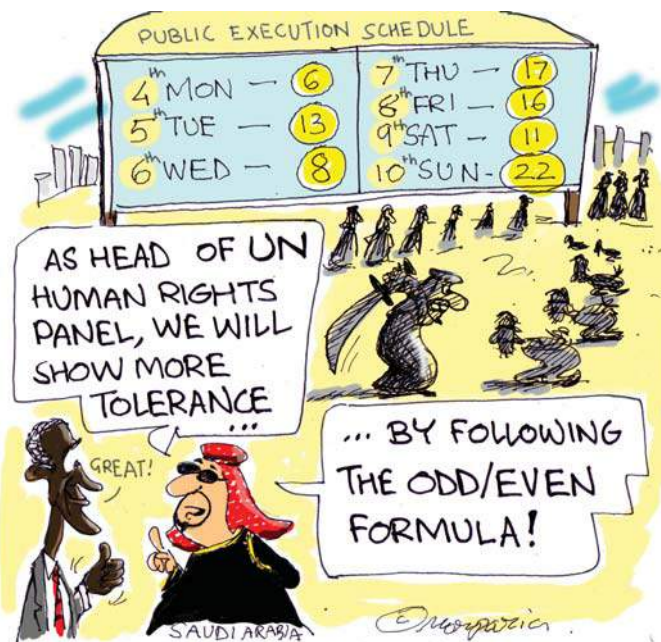
FACE TO FACE

Kavitha Kuruganti

KNOW INDIA BETTER

Bijapur: The mirage in the Deccan

MORPARIA'S PAGE



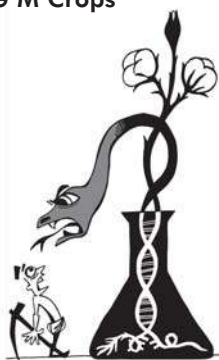
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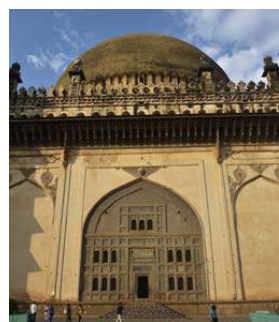
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Dr. Natesan Ramani



Bappaditya
Bandopadhyay



Captain Gurjinder
Singh Suri, MVC



Managing Editor

Mrs. Sucharita R. Hegde

Editor

Anuradha Dhareshwar

Assistant Editor

E.Vijayalakshmi Rajan

Design

H. V. Shiv Shankar

Marketing

Mahesh Kanojia

OIOP Clubs Co-ordinator

Vaibhav Palkar

Subscription In-Charge

Nagesh Bangera

Advisory Board

Sucharita Hegde

Justice S. Radhakrishnan

Venkat R. Chary

Printed & Published by
Mrs. Sucharita R. Hegde for

One India One People Foundation,

Mahalaxmi Chambers, 4th floor,

22, Bhulabhai Desai Road,

Mumbai - 400 026

Tel: 022-2353 4400

Fax: 022-2351 7544

e-mail: oiopfoundation@gmail.com

oiopsub@fouressindia.com

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LETTERS TO THE EDITOR

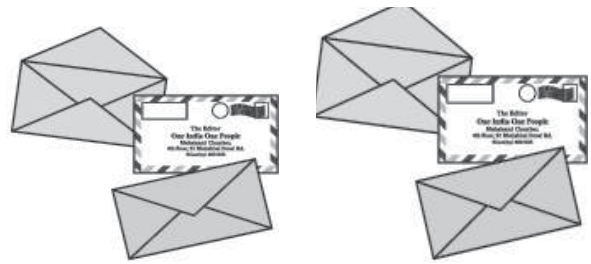
"Well thought out magazine"

I recently came across *One India One People* magazine (*The Indian food palate*, Jan.2016 issue) and was pleasantly surprised. I had not seen it previously and was not aware of such a magazine. It is a well thought out magazine. What I particularly liked was the Face to Face section and the Know India Better section. Both were very interesting, though the entire magazine had something for every person in the family to read and enjoy. The Face to Face was particularly interesting as the writer had interviewed the proprietor of Café Madras, which I often visit with my family. The rest of the articles about food were very enjoyable. I particularly liked the article on organic food (*The safe food*), for I believe that we all have to adopt organic, whatever the cost. It is a good magazine and I congratulate your team.

– M. Sasi, Mumbai.

"Thank you"

I must thank you for carrying a Know India Better feature on Pondicherry (*Pondicherry: French with a twist*, Jan.2016



issue). I have wanted to visit this place for a very long time and finally, was planning to visit this year, when I saw this feature! Quite a coincidence! It is a well written article and I must congratulate the writer. Pondicherry is really a good amalgam of Indian and French. Of the other articles, I particularly liked the article by the filmmaker Bidyut Kotoky. It's so true of Indian travel! The article by Anuradha Kalhan (*A tax to bind us all*) describing the pros and cons of GST was very informative. I really hope you carry more such informative articles in the future too. The story of the rape victim from Odisha (*A survivor's story*), who has fought her case valiantly is really heartwarming. Kudos to her!

– N. Vijayalakshmi, Bangalore.



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GMO, DRDO and what have you!

Abbreviations are horrible, whether they belong the realm of exams or well, food, says V. Gangadhar. And do we need to perpetrate a new caste system among foodgrains with the new GM foods? he asks.

A new era in the area of abbreviations has begun and we better get ready for it. Let me admit, I was not prepared for it because of the belief that the Era of Abbreviations (EOA) in India was finally over. It had harassed millions of students at various levels and I was ready to bid good bye to it.

What was my problem with abbreviations? If anyone had been in my position, they would have understood it. Since everyone in my family was keen I should prepare for the All India Competitive Examinations held by the UPSC (there I go with the cursed abbreviations) which included current affairs and general knowledge, I better be ready for them with a thorough study of the cursed abbreviations.

My problem was a strong dislike for abbreviations. God had given us nice, long names covering every single living thing and why do we have to shorten it. Somehow I developed an inborn aversion for abbreviations. But was defeated at every step. The more I wanted to lengthen language, the more I found words and phrases becoming longer. Life was getting intolerable. I passed SSLC from the south, but it got abbreviated to SSC as I moved north and westwards. The main reason for my failing current affairs in the UPSC examinations was the large number of 'Expand the following' abbreviations: BBC, AIR, UNESCO, UNICEF, DRDO, MGM, SEATO and so on. As the number of such questions went up, my performances went down. It was an unequal battle.

What has all this to do with food? I am coming to that. Whatever one can think or say about me, no one can deny I am a good trencherman and I insist that my food should taste well, smell and sound well. As the media began to publish more and more about GM – genetically modified food, my hopes grew. I liked its majestic, long, uncluttered definition. "Foods derived from organisms whose genetic material is modified in a way that is not natural, through

the introduction of a gene for different organisms". I was even more impressed with the promised hope that while today GM foods were only from plants, soon we will have GM foods from microorganisms or GM animals. Do you know that alternate modification will be by altering the nutrient content of food, reducing its allergic potential. Grand!

Let me confess, at the outset I did not know much of what GM stood for. This also happened when the US auto industry announced a massive strike of all car manufacturers and the word 'GM' was freely mentioned. Everyone at Detroit (headquarters of the US car industry) talked of the strike which also affected General Motors (GM) the largest US automaker. Since I had never owned a car the GM abbreviation was lost on me!

The first clue that GM could have something to do with food in India came to me when an Indian food expert suggested we should accelerate field crop trials of our GM crop with the ICAR (Indian council of Agricultural Research, there we go again!) and state agriculture universities.

Aha, I got it, GM had something to do with foodgrains and not cars. Then I learnt that our scientists were developing new GM

strains of our major crops like rice, wheat, maize, potato, brinjal and mustard as well as sugarcane and chick peas. Do we really need them? Don't we have enough strains in rice, wheat or maize? Most of us are aware about the havoc caused by our caste system (FC, BC, SC, ST, OBC) and do we want a repeat of this with our foodgrains? And

if the new strains in brinjal bring about new tastes, different from fried brinjal *sabji* I will not vote for it because it is my favourite vegetable. Even Dr.M.S. Swaminathan should leave fried brinjal *sabji* alone. ■

The writer is a well-known satirist.

Let me confess, at the outset I did not know much of what GM stood for. This also happened when the US auto industry announced a massive strike of all car manufacturers and the word 'GM' was freely mentioned.



Is opposition to GM just fear mongering?

What are GM crops? Why is there opposition from many scientists and many state governments and bans by many countries? Dilnavaz Variava educates us about GM crops and the risks to our food and farmers.

ONLY cotton - Bt cotton - has been genetically modified in India. The Genetic Engineering Appraisal Committee (GEAC) under the Ministry of Environment is considering approval for release of GM (genetically modified) mustard. Field trials have also been conducted for crops such as rice, mustard, corn, chickpea and brinjal – whose release was halted in 2010 due to safety concerns. Given the world wide controversy about the safety of GM crops for health, agriculture and environment, there is serious concern that biosafety test data is now not being disclosed by GEAC for independent scientific evaluation. Most state governments, however, refuse to permit tests. Like most countries in the world, they believe that the benefits are doubtful and the risks are high, unpredictable and irreversible. Pro-GM lobbyists, in the corporate world and agricultural research establishments, claim GM is necessary for food security, will increase yields, decrease pesticide use and that India will be 'left behind' if it does not embrace GM technology. Since the seed itself is modified, the GM trait can spread through pollen transfer by wind or insects and by seeds getting mixed with non GM seeds, making it impossible to control or reverse their spread. Since GM technology cannot be effectively 'regulated,' it has to be accepted or rejected, while we still have a choice. The websites of GMfree India, GMWatch and India for Safe Food provide latest updates, but the following answers some frequently asked questions.

What are genetically modified organisms or GMOs?

The World Health Organisation defines GMOs as "organisms in which the genetic material (DNA) has been altered in a way that does not occur naturally". The transference of genes in GM technology usually crosses species barriers (from bacteria to plants, a fish gene into a tomato etc). These sudden modifications do not permit normal evolutionary checks and balances (e.g, as pests develop, the predators for them also develop, creating "the balance of nature"). Since nature is enormously complex, it is impossible to predict or control the consequences.

So, is GM food safe?

Despite various claims, only two traits - Pesticide production (Bt) and Herbicide Tolerance (HT) - are currently found in 99% of GM crops. Both of these result in humans ingesting toxins produced within the plant or sprayed onto it.

Bt crops – from the bacterium *Bacillus thuringiensis* – have a gene inserted into the GM seed which continuously produces a toxin in every cell of the plant and cannot be removed by washing. It is considered far more toxic than natural Bt sprays and may even be passed onto the developing foetus.

HT crops – using herbicide tolerance genes – enable the crop to tolerate a specific herbicide so that only the weeds will die. The HT seed and the herbicide are usually made by the same company. Sale of Monsanto's glyphosate-based Round Up herbicide increased ten-fold after HT seeds were introduced. Since the GM seed patents are held by the world's largest pesticide companies, they have no interest in reducing pesticide use! The regulators rely on 'safety' studies done by the GM seed companies for 90 days on rodents - equal to about 10 years for a human. This is too short a time for cancer or organ damage to emerge. The first long-term study done for the entire lifetime of the rodents showed a great increase in tumours from herbicide tolerant maize and small doses of Round Up herbicide. This study was strongly rejected by the pro-GM lobby, but in March 2015 the World Health Organization classified glyphosate as 'probably carcinogenic to humans'.

The claim that trillions of GM meals have been eaten in USA without adverse impact is false for several reasons. Firstly, GM crops in USA have no labelling, so one cannot precisely trace their effect. Secondly, like tobacco, GM crops will show adverse effects after years. Thirdly, medical associations representing thousands of doctors have stated that GM and chemicals associated with them have led to higher incidence of cancer, birth defects, organ damage, autism, alzheimers etc. Over 300 eminent scientists have said that there is no consensus on their safety. The majority of countries do not grow GM and require labelling of products having GM

ingredients. India has passed such legislation, but is not implementing it, so Bt cotton seed oil is being mixed in our cooking oil, but not disclosed on labels.

The truth behind 'increased yields' and 'food security'

Yield is the result of many factors – the quality of the seed which is modified, the soil, climate etc. There is no 'gene' that increases yield. In 2009, the Union of Concerned Scientists, USA, studied 13 years of GM corn and soya. Their report, "Failure to Yield", found GM did not increase yields. The US Department of Agriculture Report for 2014 has also stated that GM had not increased yields. Research shows that Non-GM Europe has increased yields and lowered pesticide use far more than GM-growing USA.

In India, we had a 69% increase in All India cotton yield in the five years (2000 to 2005) when Bt cotton was less than 6% of total cotton grown. Only a 10% increase occurred in the nine years (2005 to 2014) when Bt cotton increased to 90%. GM does not increase food security. In USA, food insecure people increased from 12% in 1995 (before GM) to 15% in 2011, after 15 years of GM crops.

What are the risks from GM to environment and agriculture?

As a result of repeated use of the glyphosate based herbicide used with HT seeds, over 20 weed species have now become resistant and invaded 33% of US farmlands. The seed-cum-pesticide companies profit, as the distraught farmers spray more and more toxic herbicides.

In Bt crops, insecticide use first decreases, and yield improves for some years. But later, the main pest (e.g. bollworm) gets resistant and secondary pests (e.g. mealy bugs, white flies and other sucking pests) become a major problem. Insecticide use (e.g. on Bt cotton in India) again increases.

Agriculturally important pollinators like butterflies and bees, and natural pest controllers like ladybugs, etc., are destroyed by the herbicides and neonicotinoids used on GM seeds. Yields will eventually fall when pollinators and pest controlling species are destroyed by chemicals.

Will India 'be left behind' without GM crops?

India will not be left behind if she doesn't adopt GM.

Technologically advanced countries such as Japan, Israel, Korea, Russia, Singapore and almost all of Europe do not grow GM. Only three of the world's most developed countries grow GM, and over 90% of all GM area is still confined to just six countries: USA, Brazil, Argentina, Canada account for 83%, India 6% and China 2%. The first four, who have average farm sizes in hundreds of acres, grow mainly herbicide tolerant crops to save on weeding labour costs. China, once ahead of India, is now extremely cautious and has cancelled field trials of GM rice and corn, punished officials for 'unauthorised' trials, banned GM food for its army and destroyed shipments of 'unauthorised' GM corn from USA.

India has a huge seed market and is being constantly

lobbied to adopt GM. HT seeds drastically reduce employment from weeding. Moreover in India, where 81% of farmers are poor and have less than 1 hectare of land, costly Bt cotton seeds, to be bought afresh each year and requiring chemical fertilisers and timely irrigation, increase debts and risks for farmers. This leads to despair when prices, pests or rains fail them. Unfortunately, the

economic and social burden of GM failures does not fall on the seed companies, but on farmers - and on taxpayers for loan waivers.

The alternatives to GM

Research shows that conventional breeding has provided most of our increases in yields, not GM - and at a fraction of the cost of GM. Agro-ecology, which decreases toxic chemicals and is in harmony with nature, has been found, in a UN report, to double yields. Organic produce, whose demand is growing at an estimated 25% per annum globally, provides more employment, uses less water, improves soil fertility, gives higher incomes and achieves sustainably high yields. The highest suicides are amongst Bt cotton farmers, but there are no suicides amongst organic farmers, as they do not have to take loans to buy expensive seeds and chemicals. India has the largest number of skilled organic farmers, and this is our REAL 'Make in India' opportunity! GM contamination makes any return to organic very difficult, so USA is now the largest importer of organic soya from India. Since GM invariably causes contamination of non-GM produce, it can destroy India's agricultural export potential.

(Continued on page 16)



One India, many seeds

*Seed is life, especially in India, where seeds connote food that also become part of the local culture and traditions. Losing this rich food repository could be the worst thing to happen to our food security, says **Shalini Bhutani**, as she describes the seed diversity of India and what we must do to conserve it.*

I sprout in India, as my many ancestors did. My place of birth tells the story of the land, air, water and cultures of the area. Several persons have either kept my lineage or even mixed my pedigree. Even though I evolve, I remain rooted to where I stand. Yet, I can travel and have many relatives dispersed across the world. But I belong to no one particular person or nation. There is a large family that both looks after me and whom I feed.

I am the seed. I am life.

India's seed diversity

India is the land of many *Bharats*. It is also the land of mega diversity in seeds. Diversity means there is a mélange of crop varieties. The Indian Council for Agricultural Research (ICAR) has itself classified India into over 20 agro-ecological zones. The seed diversity in these zones form the basis for the many local food cultures and socio-cultural practices associated with them.

Also in the many little seed republics – local peasant communities organised around their seed systems – your identity is determined by the seed that you sow, grow or gather – thus, the cotton farmers in Telangana, millet growers in Andhra Pradesh, paddy cultivators in Kerala, chilli growers in Nagaland, (wild) vegetable gatherers in tribal Odisha, etc.

Nonetheless, most traditional seed systems involve the multi-cropping of varieties. Seed diversity is an insurance against the uncertainties of the future, whether economic or environmental. If all our farms and fields would sow only one kind of seed, then there is a risk of losing all in time of a disaster, like a disease. Traditional varieties selected by farmers that are flood-resistant or drought-resistant can withstand several days of submergence, and survive long periods without water respectively, and still bear grain. Also, if the price of one crop were to drop in the market, at least others would fetch a better price.

'Traditional' seeds

A distinction needs to be drawn between traditional seeds and traditional methods of farming. You might be growing



Traditional farmer seeds which are climate resilient
(Photo: Shalini Bhutani)

certain crops by traditional methods of cultivation, but that does not automatically mean that you are growing traditional seeds. Such seeds are like heirloom, passed on from one generation to the next. They are long-established varieties that have withstood the test of time and are culturally appropriate, socially relevant and ecologically sustainable. They are seeds that peasants and small farmers have developed themselves, as against sourced from the seed industry, whether public or private sector. Farmers' own seed have helped India's farmers in some parts to stay independent of the seed market. This makes it possible to realise the idea of seed sovereignty. Losing control over seed and more so, losing farm-saved seed means reliance on external sources for seed.

But it is sad that instead of reviving and conserving our traditional seed varieties, we are slowly losing them. The United Nations Food and Agriculture Organisation (FAO) makes known a worrying fact that since the 1900s, the world has lost about 75% of plant genetic diversity.

This is due to several reasons. Monocropping of large areas under corporate agriculture threatens agro biodiversity. New proprietary technologies in the seed sector, such as hybrids and genetically modified varieties, are being massively

The list of laws to protect our seeds

- Seed Act, 1966 (pending amendment by Seed Bill, 2013)
- Protection of Plant Varieties and Farmers' Rights Act, 2001
- Biological Diversity Act, 2002

All of us as consumers of the end products of the seeds – grain, flour, etc., may not be buying enough for the demand for sustainable production from traditional crops. The mindset that 'modern' seed varieties are better, may have so seeped into our thinking that we inadvertently reject local seeds as being old, outdated or of inferior quality. The first step in restoring 'traditional' seeds their due respect is perhaps to stop terming them *traditional*. It also entails revisiting your food cultures with a sense of pride.

There might be many of us also completely unaware of the entire seed architecture behind the food on our plates, and the food products on the store shelves. This means there are lesser people involved in the making of public policies on the seed. Policy makers, scientists and seed businesses then occupy this space. They, rather than seed savers and farmer-breeders themselves, have their say on seed laws. Even though there might exist customary rules on seeds at the local level. Just as the seed, the laws on them must branch out from the ground up.

marketed as part of 'modernising' agriculture. These replace traditional seeds. Modern day seeds also require chemical inputs, which poison the soil and water, thereby also damaging the health of the natural environment that traditional seeds rely on to thrive.

Conservation politics

How are the traditional seeds conserved? This question can be answered in different ways, depending on where you are. If you were in a village setting, whether individually at the household level or collectively as a community, you would save seed on site. This is called *in situ* conservation. Those who believe that conserving is about keeping something alive in its natural settings, prefer this mode. Doing so allows for the seed to adapt and evolve in an ever-changing climate. It also guarantees safekeeping of seeds close to the ones who are actually growing them. Socially, it performs another role, that of securing the role of the knowledge-holders, especially women in their communities.

If you were a scientist, whether in the public or the corporate sector, you would preserve seeds in a gene bank, just as money and other valuables are stored in a locker in a bank. You would take them out in time of need. So it is with seed.

The formal seed sector keeps them quite literally in the



Our native seeds are like heirlooms passed on from one farmer generation to the next (Photo: Shalini Bhutani)

deep freeze! The biggest of them is the Global Seed Vault on an Arctic island named Svalbard, where a back up of the world's seeds lies frozen. There are national level gene banks maintained under the National Bureau of Plant Genetic Resources, as well as at the state-level agricultural universities and research institutes. There are also 15 international gene banks, organised crop-wise around the world under the auspices of the CGIAR (Consortium of International Agricultural Research Centres). Two of these are in Asia:

- International Rice Research Institute (IRRI) in Los Banos, Philippines
- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in Patancheru, Telangana

Today, ICRISAT's gene bank in India holds seeds of about 120,000 accessions of pearl millet, sorghum, chickpea, pigeon pea, groundnut, and six small millets (finger millet, foxtail millet, barnyard millet, proso millet, kodo millet, and little millet), including wild relatives from 144 countries. These are from the farmers' fields the world over, as well as from national collections. They are kept as in-trust collections on behalf of the FAO. ICRISAT is under legal obligation to maintain these as international public goods (IPGs). This means that the seeds cannot become someone's private property.

Seed laws

Laws and policies cannot be allowed to permit exclusive property rights on the seed. They have to create a supportive environment for local seeds to be developed and distributed.

The formal state through its laws and policies, declares the legal status of seeds in the country. While under international law, seeds are no longer common heritage of humankind, but they are not the invention of a single person warranting patent or patent-like legal protection.

Central seed laws determine the kind of rights on the



Traditional crops represent our vast food treasure trove (Photo: Shalini Bhutani)

planting material, as well as on the harvested produce from it. This has become more centralised since the 'Green Revolution' of the 1960s, despite agriculture being a state subject under the Constitution of India, and despite the decentralised decision-making envisaged by the constitutional amendments of 1992. There are a host of laws that relate to seeds (see box 'List of laws', page 9), but despite provisions

How can you help?

- Buy fresh from a farmers' market wherever possible
- Keep traditional recipes alive by cooking
- Plant local organic varieties in your home
- Be aware of where you source grains, vegetables or fruits
- Let the younger generation know the importance of seeds
- Help with networking to link the small growers with consumers

on conservation therein, not all have been invoked to safeguard traditional seeds locally. ■

The writer is a legal researcher and analyst based in Delhi. She works and publishes on a wide range of issues including how free trade and its rules impact communities and conservation.



She was a faculty member at the Centre for Environmental Law, WWF-India, and is now guest faculty on legal and regulatory affairs at various universities. She is the legal counsellor for the *Apna Beej* network and supports the Indian Alliance for Seed Sovereignty. Previously she has worked with several NGOs, both national (such as *Navdanya*) and international (GRAIN). She can be contacted at: emailsbhutani@gmail.com

WHO AM I?



Sore trials

*It is a matter of great shame that agencies which are supposed to strictly regulate field trials of GM crops in India, rarely do so. They have approved trials despite evidence of multiple violations, which could have serious repercussions on India's native gene pool and treasured germplasm. **Sreedevi Lakshmi Kutty** rings the alarm bells.*

IN 2008, a reputed environmental NGO presented evidence to the Genetic Engineering Appraisal Committee (GEAC, then called the Genetic Engineering Approval Committee) of the presence of illegal genetically modified (GM) plants (GM plants that grow inadvertently due to seeds left behind without proper post harvest disposal), in the field after the trial crop was harvested. This happened with a field trial of GM rice in Jharkhand. After receiving the report and discussing it in its meeting, the GEAC warned the NGO for having taken samples outside the country (without permission) for testing for contamination. But the GEAC did not think it necessary to take any action against the crop developer company whose field trial resulted in the contamination. So the violator was not penalised, the complainant who reported the violation was put in the dock. This is in a nutshell, the story of GM crop field trial regulation in India.

Why are open air field trials a threat?

Genetic modification of living organisms is a living, uncontrollable, irreversible and unpredictable technology. Once out in nature, we can't completely control the movement of pollen or seeds or prevent cross pollination, and thereby, contamination. This could seriously impact agro-biodiversity. Open air field trials of GM crops are fraught with risks as these are tantamount to releasing unapproved GMOs (Genetically Modified Organisms) into the environment. These trial plants, in most instances, allowed to grow to full maturity, produce fruits and flowers and can easily cross pollinate with non-GM plants, thereby contaminating the native gene pool. India is considered to be one of the mega biodiversity hotspots of the world. Carrying out open air GM crop trials in this geography is a threat to this vast native gene pool, which is the store house of our food security. Violations during field trials compound these risks manifold.

Norms and guidelines of field trials

The rules under the Environment Protection Act 1989 guide the handling of GMOs. The apex regulatory body is the GEAC. Research on genetically modified crops in labs and

fields began in the mid 1990s and Indian regulators for GM crops have been approving field trials (FTs) for various genetically modified crops since then. Open air field trial approval was granted for a genetically engineered tree (GM rubber) in 2011. There are protocols and procedures laid down for carrying out field trials; these suffer from the shortcoming of not being comprehensive or rigorous enough and the problem is further aggravated by indifferent and lackadaisical implementation. The attitude of the regulators is akin to that of GM crop/tree developers (not surprising as many members in the regulatory body are GM crop developers and the body sorely lacks ecologists, biodiversity experts, social scientists or ethicists). Minutes of the GEAC meetings reveal that almost all applications that come up for scrutiny have been given a go ahead.

Norms have been laid down by the GEAC, the apex biotechnology regulator of India, for handling trials of GMOs. According to the regulators, these are broadly classified as contained (conducted within laboratories, green houses or net houses) and confined trials. The so called 'confined trials' are further classified as Biosafety Research level-1 trials (BRL-1) and Biosafety Research Level-11 trials (BRL-11). The term 'confined trials' is a misnomer as these are carried out in the open air in fields and farms and can cross pollinate surrounding non-GM crops and also get mixed up, thereby posing a threat to non-GM crops. According to the guidelines, these so called 'confined' trials have to be carried out maintaining reproductive isolation, adhering to post harvest land use restrictions, regular site monitoring after getting the relevant permissions and so on. However, in practice, almost every one of the laid down norms have been violated and continue to be violated.

How good is the regulation?

The regulatory oversight is cursory at best; the regulatory monitoring bodies have with the exception of one instance, never identified any violations. This is not surprising as RTI (Right to Information) queries have revealed that in many instances, site monitoring visits are neither a surprise nor done in time or at adequate intervals, and many a time visits are not even carried out. The violations that have been brought



The approved Bt cotton in India: Are the right norms and regulations followed in India during field trials?

to the notice of the regulator are the ones identified by civil society and concerned public. RTIs have also revealed that in no instance of field trials are tests carried out by the regulator to establish if contamination has taken place as a result of the trial. This is in violation of the Supreme Court order which states that there should be a protocol for testing of contamination, and testing should be done.

Since the last one year, the GEAC has decided to make the whole regulatory process even more opaque. They do not reveal any details of field trial applications received, which field trials have been approved, and where and when the trials will be carried out. Earlier, as mandated by its own rules and directives from the Supreme Court and the Central Information Commission (CIC), the GEAC used to put the complete agenda and minutes of its meetings, and biosafety data on the Environment Ministry website. All the field trial approval letters were also in the public domain.

None of this information is available in the public domain anymore and the secrecy makes it impossible for public to even know about what is happening, violating our fundamental right to know about how our food supply is being impacted without our informed consent. Most decisions emanating from the regulators have leaned towards less transparency, more secrecy and easing norms for approval of field trials. The secrecy also leads to greater concerns about biosafety threats from field trials and approvals of GM crops.

Violation is the norm!

Violations during field trials of GM crops have been a recurring theme right from the beginning (since GM crop research began). These include the absence of statutory bodies

at the state and district level that are supposed to regulate and monitor the FTs, use of unapproved GM seeds, improper handling during trials and post-harvest, and the absence of even basic trial protocols. Below are brief details about some cases of field trial violations that have come to light. Having said that, there would be many more cases where violations have gone unrecorded, since monitoring and oversight is almost non-existent.

One of the fundamental problems with GM crop developers and unfortunately, even with the regulators in India is the fact that they function on the premise that GMOs are safe, whereas, the approach should be one of abundant caution. The role of the regulatory bodies is to ensure whether the GMO in question is needed at all, and if so, is the safety of the GMO beyond doubt.

In India, the violations of GM crop trials begin with the regulatory apparatus itself. Theoretically, there are two bodies at the state level empowered to monitor field trials. In many states, these bodies, the State Biotechnology Coordination Committee (SBCC) and the District Level Committee (DLC), do not even exist. Even where they exist, they are only on paper and are nowhere in the picture when field trials are approved and carried out.

Sometimes, the regulatory process is a mockery. In 2011, the GEAC approved field trials for rubber trees based on protocols for a single season crop, and here the regulatory process was reduced to a cut and paste exercise. Enquiries revealed that the GEAC had not even formulated protocols for field trials of genetically engineered trees. The regulator did not respond to the complaint; fortunately, the trials got stalled due to other reasons.

Conflict of interest within the regulator is another serious concern. One such case is of Bikaneri Narma Bt cotton (public sector GM cotton), where the promoters/developers of the Bikaneri Narma were also members of the GEAC at the time the proposal for field trials and commercial approval was under consideration. The whole approval of Bikaneri Narma Bt cotton turned out to be a fiasco with the finding that the gene has been contaminated by MON531 (possibly during field trials or afterwards, nobody seems to know), a gene owned by Monsanto. Similarly, in the case of GM rice developed by the University of Kolkata, the spouse of the principal developer was a member of GEAC and made some suggestions regarding isolation distance for the field trials. Currently, the process for considering GM mustard for approval is underway in the GEAC and the colleague of the developer of GM mustard is part of the deliberations. Such conflict of interest is in violation of the basic tenets of ethical, effective and meaningful regulation.

As we have seen, when violations are reported, the regulator turns against the complainant or ignores it, but hardly ever takes action against the violating company/entity. In 2011, a Greenpeace team (along with the local media) visited trial fields in Bijapur where FT of GM maize of Monsanto was carried out. They found viable corn cobs lying around making it feasible for volunteer GM plants to sprout, the farmer was allowed to harvest the refuge plants, plant residue was not disposed off safely, and cattle were found grazing in the field (all of this amplifies the risks and is expressly prohibited). The company had entered into a seasonal lease instead of a long lease (as stipulated) and there was no DLC in Bijapur. Video evidence was submitted to the GEAC. A few months later, the GEAC set up its own investigation. Disregarding the evidence as well as a report from the state government, they concluded that everything was done as per procedures laid down.

Earlier, field trials of GM crops were allowed in farmers' fields and the farmers were not even aware that these were trial plants. In the case of GM okra (in 2006), evidence exists that the farmer had harvested the okra and sold the trial crop (unapproved GMO) in the local market for human consumption. The same has happened with Bt brinjal and Bt rice trials, where the test crops were eaten by humans and animals and sold in the market. After many such instances were reported, the Supreme Court directed that open air field trials were to be allowed only inside University campuses and on long lease lands. The risk involved with this is that agricultural university campuses are the repository of our valuable germplasm and these trials pose a serious risk to the germplasm collections. For example, a field trial for GM rice was approved at Chinsurah Rice Research Centre campus in West Bengal, that has a repository of hundreds of varieties of traditional rice.

The one instance where the regulator-appointed monitoring team identified a violation was in the case of GM maize trial of Monsanto carried out in UAS Dharwad, in 2011. The monitoring team pointed out in their report that an unauthorised GM seed (NK603, a herbicide tolerant GM maize) was used in the trial. The company had not sought permission to use it and GEAC had in another case explicitly prohibited the use of NK603. Despite the report from its own monitoring team, no action was taken by the GEAC. The cavalier attitude of the apex regulator has been a recurring problem with regard to violations in the case of GM field trials. The above mentioned instances are but the tip of the iceberg.

According to documents obtained by the DNA newspaper through RTI, it was revealed that in the last six years, only 39 out of the 133 field trials conducted were monitored, leaving the rest as potential threats to human health and biodiversity. Further, even in these 39 cases, monitoring was far less than stipulated, one site visit as against four, no post-harvest visit done, and so on. However, the Environment Ministry, under which the regulator is housed, consistently claims in the Parliament and outside that our GM regulatory system is stringent and among the best in the world!

Stop open air field trials

There is no independent, scientific monitoring of field trials. The trials are shrouded in secrecy and there are no liability mechanisms, as observed above, no action is taken against violators. In view of the serious risks and threats involved in open air field trials of GM crops, the various problems experienced till now, and the violations that take place and the gaping holes in the regulatory mechanism, both the Parliamentary Standing Committee on Agriculture (2013) and the majority report of the Technical Expert Committee (2013) appointed by the Supreme Court have recommended a moratorium on open air field trials of GM crops until the regulatory and oversight mechanism is made fool proof.

The impact of release of genetically modified organisms is irreversible and unpredictable and the precautionary principle enshrined in the Cartagena Protocol is meant to deal with the consequences of such risks. Unfortunately, the developers of this technology and in our case even the GM regulators, instead of being guided by the precautionary principle have chosen to throw caution to the winds, posing a serious threat to human and animal health, biodiversity and ecological sustainability. ■



The writer works and writes on issues related to safe food and promoting sustainable and organic agriculture, including GE-free agriculture.

An unholy alliance!

The Big Six are companies which control the global seed and agro-chemical market, determining not just the direction of agricultural research, but also which seeds the farmer will sow. Through their 'seed and pesticide packages' they are intent on eliminating competition from farmers who have always used seeds from their own harvests, says Dr. D. Narasimha Reddy. How ethical is this practice?

INDIAN agriculture is in crisis. Farmers are committing suicide and becoming poorer by the day. They are losing the battle, not with nature, which they have been in harmony with for centuries. Their battle has been with agricultural input companies. The stranglehold of agricultural input companies, across the world, on agriculture and farmers, is growing by the year. In India, in the last more than a decade, multi-national companies (MNCs) have started controlling the agriculture input companies, directly and indirectly, through patents, licensing and agreement-linked transactions over inputs. This is not a phenomena limited to India, but in fact, flowing into India from global changes.

The Big Six

Six MNCs control global industrial seed and agrochemical markets – Bayer, Monsanto, Dupont, Dow, BASF and Syngenta. They not only control markets, but also determine the priorities and future direction of agricultural research. Wherever their presence is huge, independent, farmer-oriented public sector research has gone down drastically. With collective revenues of more than ₹4,38,427 crores world-wide in agrochemicals/seeds and biotech traits (2013 figures), these Big Six control:

- 75% of the global agrochemical market
- 63% of the commercial seed market
- More than 75% of all private sector research in seeds/pesticides.

European Union, many other governments, NGOs and activists, have raised concerns over control of markets and market shares by only these companies, scuttling competition and curtailing choices of farmers in seed selection and cropping options. Their profit-making strategies are not limited to selling only pesticides and seeds, as independent products. These companies extend their control through seed and pesticide packages. Way back in 1981, ETC Group (Action Group on Erosion, Technology and Concentration, then called RAFI) warned that the spate of crop-chemical companies taking over seed companies could lead to the development of proprietary plant varieties dependent on proprietary pesticides. By 1983, Ciba-Geigy (now Syngenta), was advertising its new

seed-and chemical packages in farm publications. However, the world was introduced to herbicide-tolerant plant varieties – a proprietary seed and chemical package with the introduction of GM seeds in 1995.

Through seed and agrochemical packages, these companies try to eliminate rivals, restrict choices and in general, streamline farmer behaviour. Interestingly, the proprietary seed market is not as large as it looks. Even though it accounts for over 80% of the commercial seed supply, approximately three-quarters of the world's farmers routinely save seeds from their harvest and grow locally-bred varieties. These MNCs are continuously working on strategies to chip away at this practice of seed saving by farmers. In its 2013 annual report, Monsanto lists seed saving farmers as an aspect of competition they are facing. They try to reduce this kind of 'competition' through policy lobbying, influencing domestic agricultural research and market incentives.

Packages, not only furthers their sales position, but also camouflages product failures. If a proprietary seed variety fails, they immediately bring in an agrochemical product as a saviour. Every crisis, caused by their own products, and natural disasters, are being turned to their advantage as they control research, trade and public policy debate. In 2008, as the global food crisis deepened, profits of world's largest seed companies multiplied. Record-high commodity prices and depleted grain reserves translate to soaring demand for seeds and other farm inputs (fertilisers, pesticides, farm equipment, etc.). Monsanto's 3rd quarter profits jumped to 42% in June 2008. The Wall Street Journal noted that the seed giant is already raising seed prices "to capitalise on the planting boom it expects next year."

Genetically engineered seeds and increased revenues

For the top three companies, genetically engineered seeds account for a steadily growing proportion of revenues. Based on industry statistics, ETC Group estimates that Monsanto's biotech seeds and traits (including those licensed to other companies) accounted for 87% of the total world area devoted to genetically engineered seeds in 2007. The company claims

that it licenses its biotech traits to an additional 250 companies. In 2007, almost half (48%) of DuPont's seed revenue came from products that carried a biotech trait. UK consultancy firm, Croplis, puts the global value of GM crops in 2007 at \$6.9 billion.

For these seed and pesticide giants, it has always been a package deal – proprietary biotech seed traits depend on sales of the company's companion chemical. Their technical achievement linked to profits is the introduction of genetically modified seeds that are tolerant towards weedkillers. Today, over 80% of the worldwide area devoted to genetically engineered crops carries at least one genetic trait for herbicide tolerance.

Weedkillers account for about one-third of the global pesticide market, and agro-chemical giants are increasing research and development on new herbicides and herbicide tolerant genes. Monsanto's glyphosate-resistant (Roundup Ready) crops have brought sales and profits for over a decade – creating a near-monopoly for the company's Roundup Ready herbicide. Furthermore, two GMO crops meant for biofuel (ethanol derived from GMO corn being the largest) boosted sales for the world's largest pesticide companies the last few years – in large part due to the subsidy-driven boom supported by an infiltrated government.

Bayer in its 2014 annual report says, "In the area of crop protection / seeds, we research and develop chemical and biological crop protection agents and seeds for wheat, soybeans, oilseed rape / canola, rice, cotton and vegetables." Monsanto in its 2013 annual report says, "Our biotechnology traits compete as a system with other practices, including the application of agricultural chemicals, and traits developed by other companies. Our weed-and insect-control systems compete with chemical and seed products by other agrochemical and seed marketers. Competition for the discovery of new traits based on biotechnology or genomics is likely to come from major global agrochemical companies, smaller biotechnology research companies and institutions, state-funded programmes and academic institutions."

The mantra of agricultural productivity

These companies hang on to this package because their business runs on agricultural productivity. Yield and productivity arguments gives them the foothold in policies, and government support programmes. Decades back, it started with organo-chlorine compounds to protect crops from pests, and thus increase yields. Agri-business from then on hopped onto every 'temporary' solution from organo-chlorine to organo-phosphorous, synthetic pyrethroids, carbamates, and herbicides. In recent years, crop protection is now sold through genetic modification. However, so far, they could bring only two traits - herbicide tolerance and insect resistance. As long as governments are focused only on crop yield and productivity,

and not on biodiversity and agro-ecological production, their business would continue.

Pest problem has never gone away, but agro-chemicals and proprietary seeds have increased the range of pest incidence on every crop. New bugs, viruses and insects are being reported across the world that were not known previously for such attacks. Super weeds and Super bugs in USA have become a menace.

As per a FICCI study, the Indian agrochemical industry is estimated to be ₹25,000 crores in 2014 and is expected to grow at a CAGR (Compound Annual Growth Rate) of 12% to reach ₹45,000 crores by 2019. Out of this, the domestic market is ₹13,000 crores. In India, in 2012, there were about 125 technical grade manufacturers, including about 10 multinationals, more than 800 formulators and over 145,000 distributors. Cotton and paddy are the major consumers of crop protection chemicals accounting for 50% and 18% respectively of the total domestic crop protection chemicals market. Fruits and vegetables also account for a significant share of the crop protection chemicals market. Pesticides are used variously on brinjal, okra, tomato, cabbage, cauliflower, chillies, capsicum, cucumber, green pea, bitter melon, coriander, cardamom, fennel, black pepper, cumin, and curry leaves.

A study by FICCI (Federation of Indian Chambers of Commerce and Industry) goes on to say, "Major agrochemical companies in the world have reoriented themselves as agriculture companies, focused at chemistry and biotechnology based innovation to deliver better yield and quality of food. Companies like Bayer, Syngenta, Monsanto, DuPont and Dow Agro Sciences have both pesticides and seeds in their product portfolio. This orientation contributes to a broader perspective over the entire plant production system, because it integrates pesticide and seed technology development."

To stamp out competition and profit from the trends, the largest seed and pesticide companies gobbled up a large number of smaller seed companies. As a result, four largest seed companies control nearly 60 percent of the global patented seed market, according to Mary Hendrickson of the University of Missouri. This fact constrains farmers' choices.

In the US, with such control, seed companies charge excessively high prices for corn or soybean seed, and to supply pesticide-coated seeds exclusively, which contributes to those prices. David Widmar (agricultural economist) points out, using Purdue University data, corn seed prices have increased consistently since 2007. Before 2007, typically seed cost was 10 percent for farmers, it has averaged between 11 and 12 percent for the past six years, rising to almost 16 percent in 2014. Widmar believes it could account for a whopping 20 percent of farm profit in 2015.

In the US, about 80 to 100 percent of corn seed, and almost half of soybean seed, is coated with insecticides. It challenges the claim commonly made for years that Bt corn

seed, which is genetically engineered to kill several types of pest insects, had dramatically reduced insecticide use. The United States Department of Agriculture (USDA), which records pesticide use, has not included seed treatments, so these pesticides were not accounted for. The amount used is likely lower, because it takes less insecticide to coat seeds than to spray onto crops, but the area covered (number of acres) is now much greater. About 30 percent of corn acres were treated with insecticides that was sprayed on or applied to the soil, now about 90 percent of corn acres are treated with coated seeds. This exposes more helpful insects like bees and other pollinators to these pesticides. The ability to patent engineered traits like Bt has also facilitated domination of the seed industry by very few companies, which facilitates the ubiquity of pesticide-coated seed. Practice of coating seeds in systemic pesticides has emerged in the past 10 years.

Bt cotton, a proprietary seed, has achieved complete domination in India, with Monsanto reaping enormous profits. On royalty alone, it has earned more than ₹ 2,000 crores in India. This year, in cotton season 2015, pink bollworm has ravaged cotton crops across India, indicating the failure of

BG II proprietary seed of Monsanto. Farmers have lost their investments heavily, which is in addition to the losses they suffered due to low market prices from the previous season.

Governments all over the world need to wake up and curtail this kind of monopolies, which are destroying farming livelihoods, killing ecological diversity and degrading natural resources including land and water. Survival of life is at stake, when profits become the ultimate goal and commoditisation of life is allowed. ■

The writer is with the Pesticide Action Network and has been instrumental in producing an Andhra Pradesh status report on environment in 1990. He also was instrumental in developing Indian Organic Standards that are suitable to Indian farming conditions. He is currently a Member of the Consultative Committee of Cotton Advisory Board, Ministry of Textiles, member of Regional Advisory Group, NABARD, and Member, International Advisory Council, Textile Exchange. Under his leadership, a team has brought out 24 publications in Telugu on the handloom sector in Andhra Pradesh. He is an alumnus of the International Institute for Rural Reconstruction in The Philippines.



Is opposition to GM just fear mongering?

(Continued from page 7)

Why are even GM field trials unsafe?

Contamination takes place even from field trials under strictest regulations. In 2006 in USA, GM rice from farm trials contaminated shipments to Europe, caused an estimated loss of one billion dollars to US farmers. GM wheat from field trials done between 1998 and 2005, surfacing in farms in 2013, caused immediate cancellation of contracts from Japan and Korea. Bayer Crop Science paid the rice farmers \$750 million and Monsanto has paid over \$2.4 million so far to wheat farmers. Field trials in Indian Agriculture Universities could contaminate priceless germ plasm stored with them. Several high level committees have found evaluation, regulation and implementation extremely weak and called for a halt to field trials, till many essential steps are implemented. The reports of the following high level committees in India, which studied GM issues for several years, are important:

- The Parliamentary Standing Committee on Agriculture, consisting of 31 MPs across parties, found serious flaws with GM and its regulations. It's unanimous report prepared in 2012 stated that: *"...for the time being all research and development activities on transgenic crops should be carried out only in containment; the ongoing field trials in all States should be discontinued forthwith"*.
- A Technical Expert Committee (TEC) appointed by the Supreme Court recommended, by a majority of 5 members

to 1, that field trials must be preceded by proper biosafety and need assessment. The TEC called for a halt to all GM field trials, stating that: a) lacunae in regulatory systems must first be effectively removed, b) safety of any Bt crop must first be established by long term independent biosafety testing, c) herbicide tolerant crops should be banned totally, d) GM in crops for which India is the Centre of Origin and Diversity should not be allowed, and e) need for the GM crop must be first established by participation of all stakeholders.

- More than 250 eminent scientists endorsed the recommendations of the 5-member TEC and urged the former Prime Minister to implement it "as it is based on sound science, principles of sustainability and inter-generational justice". The Report is yet to be considered by the Supreme Court, but the GEAC under the Ministry of Environment is currently considering release of GM crops, without following the recommendations and without making biosafety data available for independent scientific evaluation. Fortunately, most state governments are respecting it and refusing to allow field trials. It is in the interest of consumers and farmers, and of our future generations, that we all demand that the TEC report be implemented rigorously. ■



The writer is a Member, Alliance for Sustainable & Holistic Agriculture; Former Member, National Committee on Environmental Planning & Co-ordination, GOI; Former Member, Govt of Maharashtra High Level Expert Committee on Agriculture; Former CEO, WWF-India and Vice President, Bombay Natural History Society.

The bogey of food security!

*Is India really food poor? No, says **Sridhar Radhakrishnan**, and explains that we are actually producing two and a half times more food than is required. Where we are going wrong is in the distribution of this food to the really needy. It's shocking that about 30 percent of the food in government godowns is eaten by rats, instead of reaching the hungry. Given this, are pesticide intensive and genetically modified foods the answer? The answer is a clear and resounding 'No'!*

"To be interested in food but not in food production is clearly absurd"

– **Wendell Berry**

LET'S start with the Food & Agriculture Organisation's (FAO) (1999) definition of Food Security - "Food Security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food, to meet the dietary needs and food preferences for an active and healthy life."

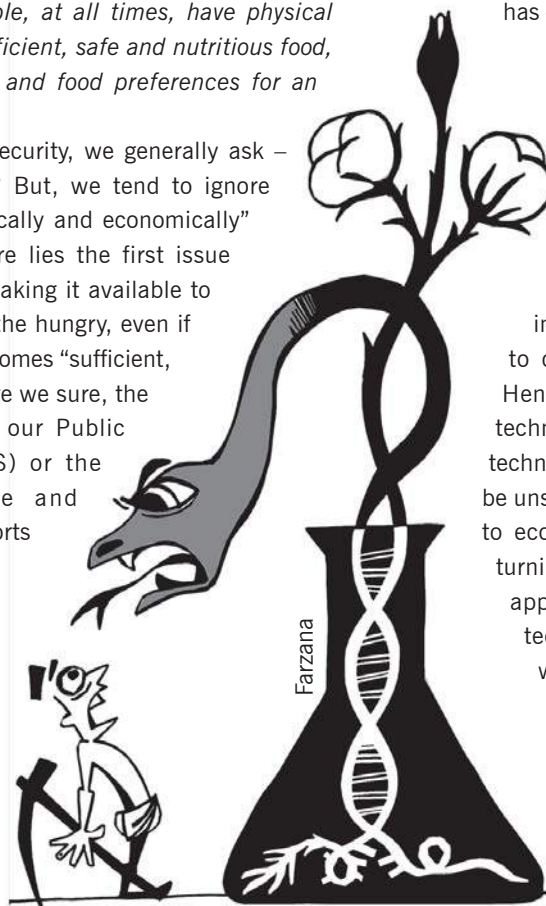
When we talk of food security, we generally ask – Are we producing enough? But, we tend to ignore whether this food is "physically and economically" being accessed by all. Here lies the first issue related to food security – making it available to all, including the poor and the hungry, even if they cannot pay for it. Next comes "sufficient, safe and nutritious" food. Are we sure, the food that we get through our Public Distribution System (PDS) or the private markets is safe and nutritious? Have all our efforts to increase food production through "Grow More Food" or "Green Revolution" improved its nutrition and safety? Clearly, after the Green Revolution and modernisation of the food industry, food has become less nutritious, unsafe with pesticide residues, processing chemicals such as colourants, additives, preservatives, flavouring agents and so on, many of them unnecessary. Today, there is an increasing population asking

for natural, pure or organic food. The last of the criteria is "meeting the dietary needs and food preferences". Here the question is about localisation and diversity. Obviously our food preferences and dietary needs are not the same as those in the Mediterranean or the Arctic regions!

Food preferences are local in character. Food has evolved along with the culture, environment and the geography of a region. Our ecosystem, climate, culture and environment have evolved a food system and agricultural system suitable for us. However, there has been an intervention into this system, and it is not a natural intervention. The global movement of products and people has led to a cultural influx into our system. We have not been able to discern and filter the suitability of this. Hence, there is a mix of food, culture and technologies in us. We can be open towards technology, but the moment we see that it can be unsustainable or unhealthy or a general threat to ecosystems or to cultural systems, as it is turning out to be, we must take a precautionary approach. We should think of whether this technology will do good or bad for us, or whether it will sustain us. Will it help us evolve into a better and healthier society?

When Green Revolution was introduced in the 1960s through high yielding varieties, chemical fertilisers and pesticides, the big issue facing the nation was the supposed food insecurity. India was depending on

what is called the "ship-to-mouth" existence, where the ships from the United States filled not the godowns, but literally the hungry Indian mouths! The aftermath of this was an





Grains stored in government godowns routinely feed rodents, instead of the hungry

increased production, grain productivity (primarily rice and wheat) and some reduction in poverty and the percentage of hungry. But after all these efforts, whereby in 50 years we quadrupled the total grain production in India, (and also globally), why is such a large population still hungry? Still deprived of their daily food needs?

Are India and the world, food secure ?

It's always a NO, that this question receives. There is nothing more farther from truth and it's surprising that most of us have been tricked into this wrong answer.

The world population as in 2012 was around seven billion, the chronically undernourished were about 870 million, of which 250 million are from India. Total food grain production in the world was 2239 million metric tonnes (mMT). All the other supplementary food items including pulses, vegetables, fruits, wild edibles etc., are not counted in the food security basket. Food security is calculated as the availability and consumption of grains all around the world. The WHO defined the family intake of food for a healthy life to be 35 kg per family per month. In India, the Food Security Act has fixed it at the same. If we compare the total food grain production of the world and the requirement of food for the actual population, it can be seen that the total population of the world can be fed with just 504 mMT, and that's less than one-fourth of the total production. Yet, why does such a huge population go hungry? It's because the issue addressed by all nations globally is only about increasing production and not about distributing it equitably to all, especially the needy. Moreover, the FAO estimates the wastage of food to be 33%. The International Institute for Mechanical Engineers, a U.K based institution estimates the wastage of food at 50%. Clearly, it's not a question of production or productivity; rather, it is post-production issues such as wastage, distribution, that leads to food insecurity.

Now, let's look at the situation in India. In 2012, India's total production of food grains was around 250 million metric tonnes, and our total population was around 1.2 billion. According to the Food Security Act, 50% of India's urban population and 75% of rural population will be entitled to a subsidised food supply. This is estimated to be the average Below Poverty Line (BPL) sector. Every such family is entitled to 35 kg of rice per month. Now, suppose we assume that the country decides to feed 100% of the population (we will call it UPDS-100) directly with the same formula, only 100 million metric tonnes of grains are required. We already produce 2.5

times what we need. We have been misled by academicians and food experts that there is a food shortage in the country, when we really do not have one.

In fact, India even during the Independence period never had a food production issue. Even in the 1950s, and throughout after that, we were producing for more than 2.5 times the population. Still, lakhs of people were kept in perpetual hunger. Why? Because food was never produced for equitable distribution, instead it was produced for the markets, and those who had money bought it. Sometimes, it was for the hoarders, sometimes for the rich in India, sometimes it was the army, and sometimes even for export, but never for the



Farmers with a traditional, tall, high yielding variety of paddy (Photo credit: Save Our Rice Campaign)

really deserving. And today, the situation is worse. According to the government's own admission, at least 30% food produced and stored for supply is eaten by the rats. And that's the quantity needed to feed its chronically undernourished population. So we have a nation feeding its rats but not its poor!

The corrupt economics of food

Actually, food is going through a process of a corrupt economy – appropriation, commercialisation, hoarding, smuggling etc., which has had its impact on prices as well as food availability. The sudden spurt in global food prices all over the world is also because food grains have either gone into the meat industry as fodder, or into the biofuel industry.

In the last 50 years, there has been an intensive change in the way of cultivation that the pesticide and fertiliser companies have become millionaires. Everyone in the food-trade chain has reaped the benefits of this system except the real farmer. The average monthly income of the farmer still remains at less than ₹ 3000. More than three lakh farmers have committed suicide in India in just a decade. Farming has become non-remunerative and the people who provide us with food security are dying. This needs to be addressed. The M.S. Swaminathan Commission for Farmers in 2004 had recommended a higher payment of Minimum Support Price for the farm products, but even the present Government refuses to implement it. Recently, the 7th Pay Commission for government employees has fixed the lowest entry pay at ₹ 21,000, but the farmers' average income lingers seven times below this. Last year, the largest grouping of farmers' organisations, together representing 40 crore people, came together under the banner of Kissan Ekta, and demanded that a Farmers Income Commission be constituted, before such huge dole outs are paid to already wealthy employees. After all, they are not killing themselves in chronic debt, like farmers!

What is also needed is to develop and revive a system which is safe and sustainable. Farmers who are life givers have themselves been made murderers through the excessive use of pesticides and chemicals. They themselves are getting eliminated through this system of farming. The entire food chain is poisoned and the accumulated impact of this on the environment is very high. The Centre for Disease Control (CDC) in America has found on their research on newborn babies that 287 chemicals are found on an average in an American newborn baby. If that's the situation in a well-regulated developed nation, imagine what would a blood analysis of all of us in India reveal. Looks like we are all a living, ticking bomb, waiting for the next cancer or endocrine disorder to happen.



The Green Revolution increased agricultural yield in India, but has almost irreversibly spoilt our soil and ecosystem

Science of safety has progressed over time, and the world has banned many pesticides, but In India, we still continue to use them. In 2011, out of the 229 pesticides registered for use in India, 67 were banned in other countries. We continue to use them, thanks to a dangerously corrupt regulatory mechanism. It's just not the chemicals that are hazardous, our regulatory system is itself criminally hazardous!

The Green Revolution that wasn't

In a recent report, the Planning Commission had also accepted the fact that the Green Revolution did not deliver. What it actually did was to poison the entire ecosystem we are living in. Our biodiversity and agro-biodiversity have been lost due to the overuse of chemicals and pesticides which are being banned all over the world. Our best seeds, locally evolved, many even high yielding, many medicinal in value, many with potential even in a monetary sense, have all been wiped out and we are left with a few unsustainable high yielding varieties and hybrids. Imagine, in rice alone we had 1.5 lakh indigenous varieties, today we are left with a few thousands.

Genetically modified and engineered seeds are now the next new threat. After the biosafety data on Bt brinjal was revealed, and after lakhs of Bt cotton farmers killed themselves in India, we have realised two things – One, these seeds are much more expensive than the native varieties available. Second, these seeds have serious health effects, many well documented. And worse, the Multi National Companies (MNCs), or even the public sector agencies refuse to divulge the truth about the impacts of the seeds. The most recent question asked in the Indian Parliament, also got us the same answer – that genetically modified crops are not known to have any adverse impacts. Even the minister-in-charge is forced to lie in the Parliament, inspite of a compilation of 400 studies showing adverse impacts available with his Ministry!!

And what's the argument that these scientists or governments or even the MNCs put forth for promoting

pesticides or even GM crops – food security! The argument is that India will not achieve food security if we do not adopt such technologies.

India is four times food secure! It's delivery and safety that matters now!

Adequate food production has been achieved. In fact, for feeding the nation (food security), India Government only procures about 25 to 30% of its food grains from farmers. The rest of the farmers are forced to sell their produce in the markets, and get swindled many a times by the market hawks and cartels. So, the focus needs to now shift to see how the farmer's livelihood can be enhanced with a better income. This is why the need for the Income Commission for Farmers becomes important.

We must also now refocus agriculture in India, and the world. Our focus should be to revitalise the small farmer, the small land holding, to enhance productivity through reducing cost with a low external input, in short, sustainable agriculture. We need to bring back our native varieties of seeds which had natural resistance and resilience to our soil and climatic conditions. This is the only sustainable hope for economic development, combined with climate resilience. Hence, a total revamping of the system is required at the operational, administrative and spiritual level.

Organic farming/natural farming - the viable option

The face of organic farming has changed globally. From the conventional organic farming to a more intensive, but simpler system, which is optimising the use of inputs. One example is the use of cow dung and cow urine. Earlier, these were used directly in the farms, but now farmers have developed their own biotechnology - *Panchagavya*, *Amruthpani*, *Beejamruth*, *Jeevamruth*, five-leaf pest repellants and many such mixtures are all cow-based, and have become the sustainable farmers' *mantra*. There have been major changes in the agronomic practices, which has made agriculture at par with normal chemical agriculture, but more sustainable, safe and most important, sovereign. It's also been clearly demonstrated that small-scale agro-ecological farms are the

most effective, and the world can be provided enough food by this method.

In a study by the United Nations Special Rapporteur on Right to Food, 289 projects in 57 countries covering 37 million hectares were evaluated and it was found that agro-ecology increased productivity on an average 79%. According to the study - agro-ecology does not rely on chemical insecticides or GM crops for pest control, instead fosters beneficial biological interactions. Agro-ecological approach raises productivity at field level, reduces rural poverty, contributes to improving nutrition and also contributes to adapting to climate change.

Obviously, the need of the hour is to revive and maintain agriculture sustainably and food security in a safe way and ensure the sovereignty of our nation's agriculture. The political system has changed in such a way that our ecosystem, culture and lifestyle are being designed by agents of poison and profits, with whom we have got into trade relationships, rather than cultural and scientific relationships. This has to be addressed, and today a large group of individuals and institutions are addressing this in a collaborative way, globally and nationally. Hundreds of organisations in India are doing deep rooted work to change the face of this nation through sustainable agriculture. Sikkim is the best example. Recently, launching Organic Sikkim, Prime Minister Narendra Modi appealed to all states to adopt organic farming, and said the winds of organic is now going to take over the nation!! It's a dream, let us as consumers and farmers be a part of this wind of change.

Let me conclude with another Wendell Berry quote - "When going back makes sense, you are going ahead."■



The writer is an Engineer by profession, and has been associated with the Environment Protection, Sustainable Agriculture and Safe Food movements in India for the last two decades. He is presently Director of Agriculture and Food Sovereignty Programmes in Thanal, a voluntary organisation, based in Kerala. He is Co-convenor of the Coalition for GM-Free India, and a Coordinator in the Save our Rice Campaign, a food security movement.

Did you know?

The state of Sikkim is the first fully organic state of India. The landlocked state in Northeast is now officially a completely organic state. Over the years, around 75,000 hectares of land has been converted into certified organic farms following the guidelines prescribed by the National Programme for Organic Production. Organic cultivation doesn't involve the use of chemical pesticides and fertilisers and thus helps to maintain a harmonious balance among the various complex ecosystems. Also, it has improved the quality of the soil which further improves the standards of the crops produced there. Within 1.24 million tonnes of organic production in the country, around 80,000 million is supplied by Sikkim alone.

GM crops or agro-ecological practices?

Food security is a mega issue for a country like India, with her burgeoning population. How can one increase food production? Are GM crops the answer? Dr. G.V. Ramanjaneyulu disagrees and firmly believes that agro-ecologically sound practices, which also drastically reduce the use of pesticides point the way toward food security, for both the nation and the farmer. He also describes why GM crops don't increase yield.

REPORTS of the Parliamentary Standing Committee and Supreme Court Technical Expert Committee on the Genetically Modified (GM) foods have brought back the issue of biosafety of GM crops to the centre stage. The argument of the industry and Ministry of Agriculture is that GM technology is essential to meet the food needs of the growing population. This argument trying to link hunger with a lack of adequate production, which can only be met by GM crops, is untenable. Today, even with record production and buffer stocks overflowing, hunger and malnutrition exist. India has close to half its children malnourished, is ranked at virtually the very bottom (120th / 128 countries) of the Global Hunger Index and has one of the highest proportions of people consuming less than the specified calories.

It has been 18 years since the first GM crop was commercialised. Yet, the technology is stuck at only two commercially viable traits which are cultivated mainly in three countries (United States of America, Brazil and Argentina, which grow 77% of all GM crops). If you add India (with 11.6 m ha under cotton) and Canada (with 11.6 m ha under canola, maize and soybean), then together they account for about 89.79 % of the total GM cropped area. An overwhelming majority of countries worldwide do not grow GM crops. GM crops are grown on a mere 181.5 million hectares that comprise 3.2% of the global agriculture land. About 99% of the area under GM crops is covered by just four crops: soybean (47%), maize (32%), cotton (15%) and canola (5%). The two traits that have been commercialised are essentially: (1) Insect Resistance crops modified with genes from *Bacillus thuringiensis*, inserted for a new toxin to be produced within the plant to kill insects; and (2) HT or herbicide tolerance, where the engineered plant is able to withstand specific herbicide sprays. Herbicide Tolerant GM crop is the overwhelming trait in commercially grown GM crops today. Significantly, these traits are not for increasing the yields.

The GM 3 and the yield myth

Examining the food security situation of the three countries that have adopted GM crops on a massive scale, it is evident that the situation has worsened or remained the same after

the introduction of GM crops. Clearly, these crops are not meant to address food security or hunger, but to fill the coffers of agri-business corporations whose profits during the same period have climbed.

In the USA, in 2011, according to the US Economic Research Service, 17.9 million households were food insecure (constituting 14.9% of American households that were food insecure) at some point in the year. This means that an unprecedented 50.1 million people (1 in every 6 Americans) live in food insecure households in this nation, which has the largest area under GM crop cultivation in the world, after having begun commercialising crops with this controversial technology since 1996. Food insecurity has increased to 15% of the population from where it was at 12% during 1995, and since then there has been a consistent increase. Despite massive adoption of GM technology, the USA does not seem to be able to address increasing hunger in the country. On the other hand, even farming has not become profitable and propping of agriculture with massive subsidies continues with 15 billion dollars given as direct agricultural subsidy in 2012.

Studies by USDA (United States Department of Agriculture) scientists have shown that the yield benefits (3-4%) of insect resistant crops depend obviously on pest infestation in a given season. On the other hand, in trials of herbicide tolerant soybean, "yield drag" effects were noticed, adversely impacting yields. Even in India, the experience of Bt cotton shows that the yield increase is not much. During 2001-02 the average yield of cotton in India was 308 kg/ha which increased to 470 kg/ha in 2004-05 and to 552 kg/ha in 2013-14. The area has increased from 5.8 m ha to 11.5 m ha, with much of the spread into rainfed, shallow soils, which has increased the risk of crop failure. The yield increases were in the areas which had good irrigation potential. The reports from Gujarat and also the Vidharba region clearly show that the performance was very bad in rainfed areas. In a country with more than 60% area under rainfed cultivation, this doesn't seem to be a solution.

Reduction in pesticide use?

The last 10 years' experience of Bt cotton shows that there is an apparent pesticide use reduction for bollworm management

in cotton, which can also be attributed to a shift from high volume pesticides to low volume pesticides and also reduction in use of synthetic pyrethroids, adoption of IPM/IRM/NPM practices which restores the ecological balance. During the same period, a similar trend was observed in other crops as well. However, the insecticide use for the management of sucking pests have increased in cotton, which could not provide any respite to farmers in terms of cost reduction.

The opposition to GM crops is not just because of it being an alien technology or controlled by multinational corporations, but because of serious shortcomings in the technology itself, coupled with regulatory failures. The recently concluded Convention on Biodiversity also brought this discussion to centre stage, and called for a liability and redressal mechanism to ensure biosafety.

On the other hand, every complex problem need not have a complex solution. There is consensus of opinion by virtually all international agencies that the solution to food and nutritional security is through agro-ecological sustainable models of agriculture as stated in the findings of the IAASTD (International Assessment of Agricultural Knowledge, Science and Technology for Development) report. The IAASTD, to which India is a signatory, is a 4-year study commissioned by the UN and the World Bank, by over 400 scientists. The IAASTD makes it clear that the road map for agriculture for the next 50 years must be through localised solutions, combining scientific research with traditional knowledge, in partnership with farmers and consumers.

The field experience of agro-ecological practices

The emerging new paradigm of sustainable agriculture based on agro-ecological principles shows that the new knowledge synthesised from traditional practices and supplemented with modern science can bring in ecological and economic benefits to the farmers.

One very good example for such a model is the scaling up of Non Pesticidal Management (NPM) in Andhra Pradesh through federated women self-help groups (SHGs). Non Pesticidal Management, an initiative by Hyderabad-based Centre for Sustainable Agriculture (CSA), is an ecological approach to pest management using knowledge and skill based practices to prevent insects from reaching damaging stages by making best use of local resources, natural processes and community action.

Pests and pesticides contribute to the major economic and ecological problems affecting the farmers, crops and their living environment. Two decades of experience in Andhra Pradesh in NPM shows that pest is a symptom of ecological disturbance rather than a cause, and can be effectively managed by using local resources. After more than a decade of participatory research with farmers by Dr. M.S. Chari and Dr. N.K. Sanghi, both ex-scientists from ICAR (Indian Council of

Agricultural Research), such models have been established in several villages in Andhra Pradesh, which is one of the high pesticide using states in the country.

In 2004, CSA collaborated with the Society for Elimination of Rural Poverty (SERP), an autonomous body under the Ministry of Rural Development, Government of Andhra Pradesh and women SHGs to scale up across the state. A 'Farmer Field School' approach was adopted to build the knowledge and skills of the farmers in understanding their crop ecosystem and taking up necessary action. Experienced farmers were used as Community Resource Persons for campaigning and reach out. The programme which started in 12 villages in 2004, has rapidly spread across the state. By 2008, the reach was extended to seven lakh acres, and currently the reach is around 36 lakh acres across 11,000 villages. What is interesting is that the state which was using about 1997 mt (metric ton) of pesticides in 2005, could reduce its pesticide use to 1015 mt by 2010. The pesticide use per acre reduced from 0.34 kg per ha in 2001-02 to 0.09 per ha in 2010 (<http://ppqs.gov.in/lpmPesticides.htm>). Compared to any other state in the country with similar cropping patterns and practices, this is a significant reduction. The farmers could save about ₹ 5000 per acre on average on inputs without compromising on yields. The experiences are widely documented by several researchers and media. The programme which started with Non Pesticidal Management has now brought in various other practices from across the country to be integrated into the system.

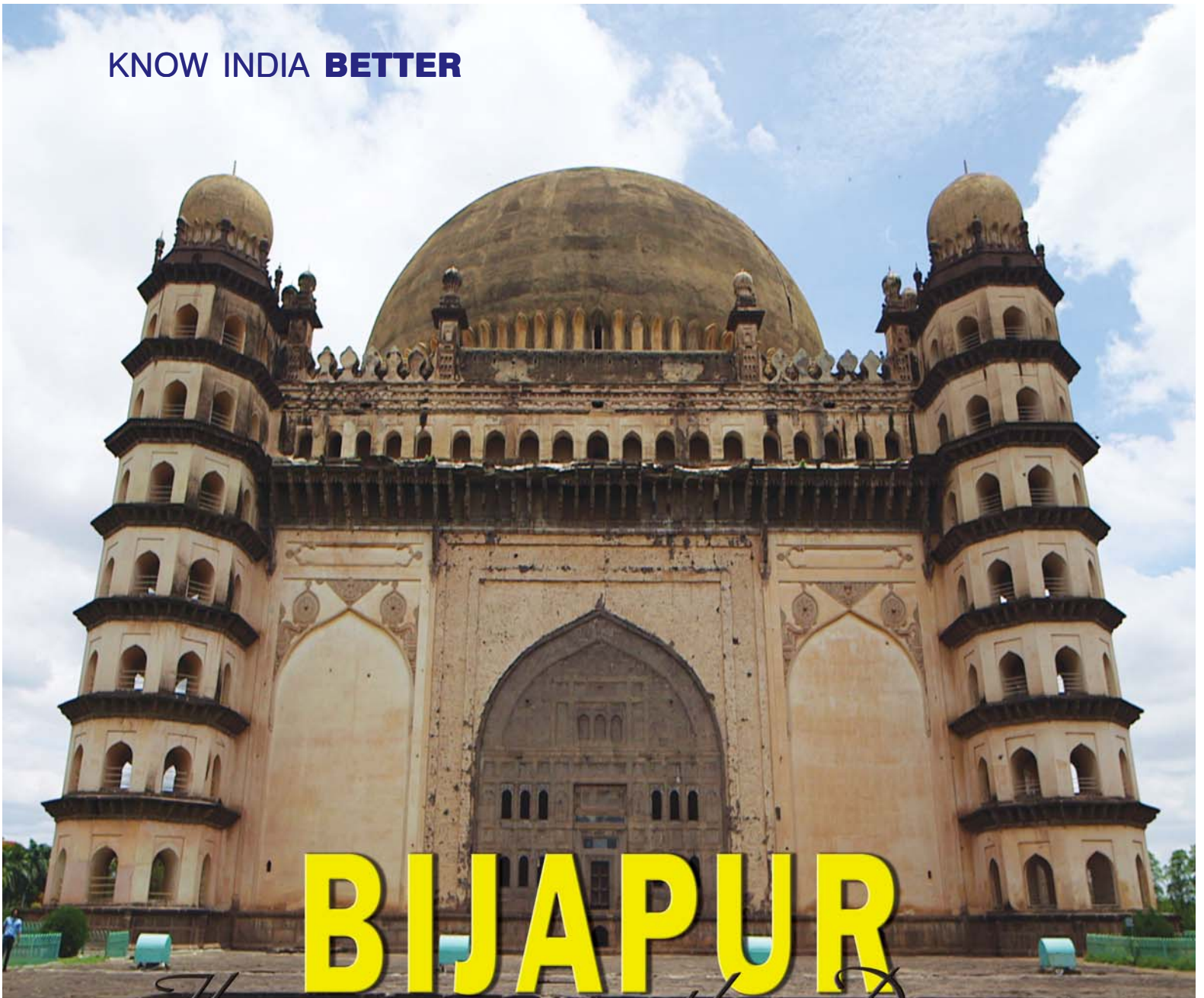
This model has also been tried in other states like Maharashtra and Chhattisgarh. The model by CSA in Wardha and Yavatmal districts of Maharashtra has won the Best Innovation Award at the Maharashtra Rural Livelihoods Innovation Forum and Bihar Rural Innovation Forum this year. This model is now adopted across the country as part of the Mahila Krishi Saktikaran Pariyojana (MKSP), another flagship programme of the Government of India to empower women farmers.

This shows that Community Managed Sustainable Agricultural models are better ways to address the agrarian crisis and ensure food security to the nation and income security to the farmer. ■

The writer is an agriculture scientist currently working as Executive Director, Centre for Sustainable Agriculture (CSA), Hyderabad, India. His main focus of work is on technologies, institutions and policies which help to improve the economy and ecology of farming. CSA's work on Non Pesticidal Management and Community Managed Sustainable Agriculture in Andhra Pradesh and Maharashtra is widely acknowledged as a model which can help small and marginal farmers to sustain their livelihoods. The NPM initiative in AP reduced the pesticide use in the state by more than 50% and was covered in *Satyamev Jayate's* first season. A report on *Modern Agriculture and Erosion of Agrobiodiversity* was presented at the Convention on Biodiversity COP-11.



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The mirage in the Deccan

The city of Bijapur, set deep in the Deccan, may just be a fleeting throwback to its medieval days of unmitigated glory, yet it still has a sparkle, which holds its visitors enthralled. Bijapur's monuments don't tell the entire story, though world renowned they may be. The attraction lies in the telling and retelling of the various battles, poignant legends, tales of clever politicizing, and lavish cultural endeavours which marked the reigns of the succession of Bijapur's rulers. The role of the queens of Bijapur also fascinate, for their role in its history was noteworthy, with some swashbuckling valour thrown in for good measure. Bijapur is a city with many a shimmering past, grab one and it may just enticingly dissolve into the mirage of the next...till you exhaust yourself of all its possibilities, well and truly spent.

Text & Photos: Akul Tripathi



The museum outside Gol Gumbaz (opening page), the erstwhile Naqarrakhana or Naqarra House

SO I love road trips. I love the scrub of the rubber on the tar, on the gravel, on the concrete. The way they hold on to each other before their smooth release from an embrace of gravity, like partners in a trapeze act - certain that they will meet in the next swing. For that is their destiny. And those moments of imperceptible caress as you begin to glide, succumbing to the pull of the stars...

...there, in those fragments of time, staring through the window and gazing at worlds that must have been, that could have been and the many that will be; within the minuscule molecules of miles, creation dissipates into a kaleidoscope of possible improbabilities, satiating unspoken and oft unacknowledged desires and greeds levelling into an equilibrium of soul energy across existence.

Travel nirvana? Yes, that is what road trips are about...

A gem of a city

But watch out. The ecstasy of hurtling through thoughts and visions; while addictive and disarming, can cause losses unpardonable. Sure, the inviting roads of Karnataka would be a partner in crime to the ages that reduced a metropolis to a blip on the map. For the glassy unblinking stares of dreamy eyes can skip over wormholes of history, of incredible stories that are the bevelled embroidery on a cultural fabric which within its intricate weaves conceals and thus saves from certain extinction, memories of a time when the Deccan flowered with all the nobility that Delhi or Agra's cultural delight could

offer and more. Where a potpourri of cultures and the beginning of traditions were not just salutations or footnotes, but truth unfolding in real time.

An imperial capital, a gem embraced in the folds of volcanic magma, born to reflect the fire trapped in its rock, polished through epochs to a retina wrecking shine that blinded the ones who had seen the best the world had to offer. It scorched paths of blazing glory for a couple of centuries and then was condemned back to an ashy existence.

Five hundred thirty kilometres from Bangalore, glimpses dance between stark condominiums and tin roofed settlements with the occasional sore thumbs attempting to imitate a glory long gone. There materialise monuments that should be mirages. For they have no place in the today. For they belong to a time when this soil was revered as Bijapur. When imagination bordering on magic cut and polished the basalt into a basin in



The awe-inspiring dome of the Gol Gumbaz



The entry door to Ibrahim Rauza

which poured the seekers of the world. The meek, the sleek and the geeks without concern to any lines that may divide, put their back and buck together and raised on their mortal shoulders an edifice to eternity. A city of their dreams. A city, the more of which you know, seems like it could only have been a dream. A city that you cannot today understand or know completely...

The twilight hours

The infant days of what we today know as Bijapur begin with its founding by the Western Chalukyas (also known as the Chalukyas of Kalyani) in the 10th and 11th centuries. Some attest to older inhabitations which is probable, but Bijapur as a city of importance in the political sphere of the subcontinent, emerges at this time. Though, at this juncture, it was known as Vijayapura (City of Victory). After the decline of the Chalukyas, the city changed hands to the Yadavas in the 12th century. The 13th century saw the Sultans of Delhi turning southward and looking to gain a foothold in the Deccan and beyond. The tyrant Alauddin Khilji through his commander Malik Kafur spread their influence on Vijayapura and they held sway on it till they were ousted and the Tughlaqs took control of Delhi. In the



The floral and geometric motifs on the ceiling of Ibrahim Rauza

series of political instability that is characteristic of medieval India, Zafar Khan, who served under Muhammad bin Tughlaq, revolted and set up his own kingdom in 1347 which came to be known as the Bahamani Kingdom, and Zafar Khan became Ala-ud-din Bahaman Shah, the founder of the Bahamni Sultanate with its capital at Gulbarga. For nearly almost another century and a half, Vijayapura was just another satellite town revolving around Gulbarga and then Bidar, when it became the Bahamani capital.

It would have to wait till the last decade of the 15th century for Vijayapura to be reborn as Bijapur - the jewel of the Deccan. Continuing the strings of political instability, as set into the Bahamani Empire, the governor of Bijapur, Yusuf Adil Khan, in 1489 declared himself as the independent ruler. The allure of the Deccan that would be Bijapur has the intriguing life of its founder as its bedrock. Intriguing, primarily for the diametrically opposite views on the stories of his origins, stock and roots.

The generally accepted notion is one so oft-heard in the workings of kingdoms that sprouted in the middle ages where slaves earned favour and became commanders, who then took over their once masters. In line with this narrative, many believe Yusuf to be a Georgian slave purchased by Mahmud Gawan - the celebrated prime minister of the Bahamani Empire and under whose tutelage the extremely able slave, by his talents and great war skills, became the king's favourite. Initially he was adopted as master of horse, later promoted to Hawaldar of Bidar, before being made Governor of Bijapur in 1481.

The other, a more sensation telling claims him to be a son of the Ottoman Sultan Murad II who had to flee modern day Turkey as his brother had come to power and would kill all other claimants to the throne. Yusuf, hence, travelled to the Deccan and joined the army of the Bahamani Kingdom. Both stories agree on his progression through skill to become the Governor and then King of Bijapur.



The Ibrahim Rauza (left), called Deccan's Taj is a riot of bulbous finials and false and real minarets; (right) the mosque

Yusuf waged several wars with his neighbours - the powerful Vijaynagar Kingdom to the south and even his Muslim neighbour from which he had seceded. In his rule from 1490 to 1510, he set up a small but virile kingdom with a citadel he had built in his days as governor at its centre. He also built the Farroukh Mahal (also called Chini Mahal - perhaps from the Chinese ceramic said to have been used as tiles) of which remains a lofty *darbar* hall and a series of rooms as its wings. Despite all the lavishness and grandeur that was to follow, the sheer size of this edifice lets it hold its own in a city where super-sized would soon become the norm.

Besides formally establishing the kingdom, the most important decision of Yusuf would be to marry Punji - the sister of a Maratha warrior. This one act would be the seed that would ensure the longevity of his nascent empire and its astonishing multi-cultural aspect as a confluence of cultures of the Deccan. The wisdom in his choice of life partner became evident immediately on his death when Punji Khatun, as she would be formally addressed, came to the rescue of his empire.

Yusuf died in 1510 in a way that befitted the founder of a kingdom - at war with Vijaynagar where he is believed to have

been struck down by several arrows. At this juncture, his son Ismail was still a boy and the affairs of the state were managed by the minister Kamal Khan who imprisoned the young king and tried a coup. Punji Khatun hatched a counter plot and Kamal Khan was stabbed to death in the royal palace. After his death, Kamal's son Ismail Khan is believed to have marched to the palace to avenge his father and the whispers speak of how Punji in male attire valiantly defended the palace from a coup to grab the throne by Kamal Khan's son. Ismail Adil Shah thus became the ruler of Bijapur and succeeded his father's ambition.

Ismail Adil Shah did what any deserving son to a conquering father would. He followed in his father's footsteps and in the next 24 years of rule, expanded the boundaries of the small country that was bequeathed to him. Ismail, however, unlike his father leaned towards the Shia faith of Islam, and introduced that as the state religion. A decision for which he faced stiff opposition but one he implemented nonetheless. Ismail died in 1534 while on campaign in Golconda. After his death, his oldest son Mallu was crowned king.

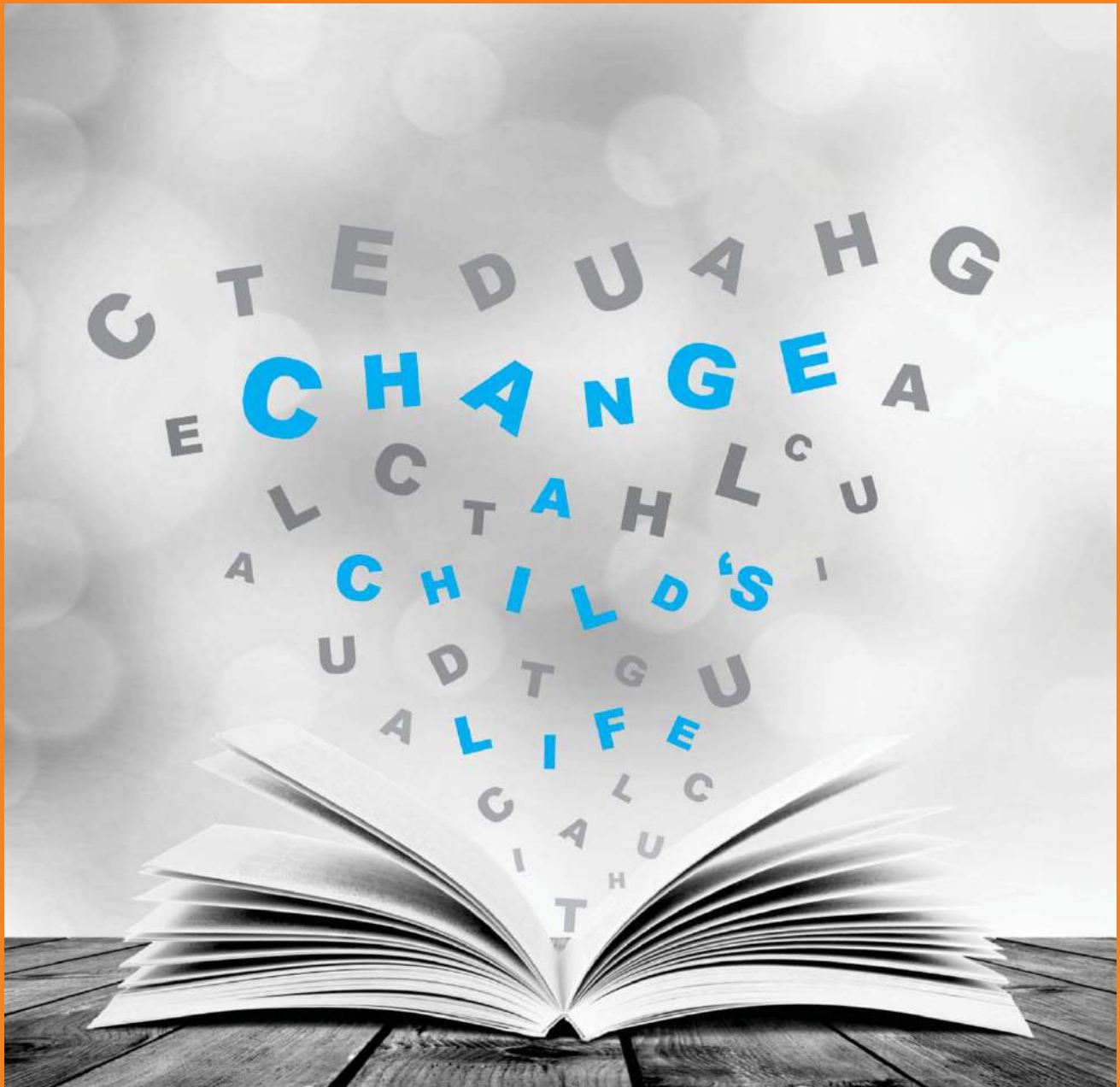
Mallu, in very common knowledge, was an ineffectual ruler and in the company of evil habits. Knowing that the future of



The Ibrahim Rauza and the water tank in the foreground



The Ibrahim Rauza complex



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The ruins of the Gagan Mahal built by Ali Adil Shah in 1561, as a royal palace

the dynasty was at stake, Punji Khatun once again came to the rescue of Bijapur, and with the help of her son the late emperor Ismail's trusted general, Asad Khan, deposed Mallu and had his younger brother Ibrahim Adil Shah I crowned as king.

Ibrahim Adil Shah I deviated from the traditions of his predecessors and introduced many innovations in the political and religious policies. Being a devout Sunni, he discontinued his father's Shia practices and reintroduced the Sunni practices. During his time, the Marathas and the *habshis* found high place in his court so much so that, public accounts were also maintained in Marathi. Like his father, Ibrahim's reign was also for 24 years and a few months. However, unlike his father, Ibrahim's constant warring did not extend the states boundaries by much. Ibrahim cannot claim any significant additions to the kingdom he inherited except for some territory on the western coast of India and Bijapur now extended till south of Goa. Ibrahim Adil Shah, however became the first ruler of his family to use the title of *Shah* while his father and grandfather had used the *Khan* title.

A new dawn

After his death in 1558, his son Ali Adil Shah took over the reins of the Bijapur administration. Continuing the seesawing tradition in the family, on the day of his coronation, Ali Adil Shah reversed several *diktats* of his father and also, once again, brought back the Shia faith as the state religion. While the start was not one to indicate greatness, the golden period of

Bijapur can be said to begin during the reign of Ali Adil Shah.

Bijapur, despite its many successes, was a small kingdom and always at risk of being run over by someone of power. Money too, was limited given the constant warring and campaigns that were the way of life for the first three Sultans, without any windfall gains to have occurred. Spends were primarily on defence installations and upgrading of the army as this was necessary for Bijapur to survive. Ali Adil Shah perhaps understood the divide and rule strategy of Vijaynagar and played the game better than any other ruler of the time.

On one hand, he established very close ties with Vijaynagar and even visited the capital city of Vijaynagar. On the other hand, he was instrumental in creating the successful confederacy of the Deccan Sultanates against Vijaynagar that led to a resounding victory for the Sultanates in the famous battle of Talikota in 1565. Besides the extension of the Bijapur kingdom to the south, right up to the city of Vijaynagar, it brought a significant portion of the wealth of a ridiculously prosperous empire into the coffers of the Bijapur State. This victory is undoubtedly the greatest achievement of his rule and the greatest military achievement in the history of Bijapur - perhaps the reason behind the flowering of Bijapur itself. For along with the victory came riches and with the money, the desire to build not just a city, but a capital that would be the envy of the world.

Ali launched into this activity with great vigour and Gagan Mahal or Heavenly Palace was built by Ali Adil Shah I in 1561



The Malik-e-maidan cannon, which is at the Bijapur Fort and is considered one of the largest pieces of artillery ever forged. It was used in the Battle of Talikota

as a royal palace with a durbar hall. It has three impressive arches and the central arch is the widest. The durbar hall was located in the ground floor while the first floor was built as the private residence of the royal family. Most of the building is now in ruins, but the grand arches give an easy idea of the opulence that must once have resided here.

With the defeat of Vijaynagar, came refugees in thousands. To ensure adequate water supply for them, he commissioned the building of the Chand *bawdi* - a large well that could quench the thirst of the ones seeking shelter. Chand *bawdi* is perhaps named after another commendable decision of his - marriage to the famous woman warrior Chand Bibi of the Ahmednagar Nizamshahi clan. Not only did it bring close familial relations with another Deccan Sultanate, but like Punji Khatun before her, Chand Bibi too would be pivotal in ensuring that the Adil Shahi dynasty did indeed survive to see its golden age.

The fort and the citadel built by his great grandfather and founder of the dynasty Yusuf were further strengthened. The circumferential length of the fort's outer wall which enclosed the old city, measured 10 km. It was strongly fortified with the most massive materials with ninety-six large bastions of various designs. In the days when Bijapur Sultanate commanded almost the whole of the Deccan territory, the strongly fortified fort had more than a thousand canons made of brass and iron. While many cannons still lie around Bijapur, the most famous one, if not the largest pieces of artillery ever made - is the Malik-e-Maidan cannon - the monarch of the plains. Many

consider it the largest mounted cannon ever forged. Made of bell metal - an alloy of copper, iron and tin, its creation is credited to a Turkish engineer Mohammed Bin Hassan Rumi in the year 1549 AD. Because of the alloy, the gun surface is relatively clean and has no rust. It is believed to have been used in the Battle of Talikota from where it got its name. The cannon is four feet long, measuring 1.5 meters in diameter and weighs 55 tonnes. The nozzle is cast in the shape of a lion's head with its fangs bared open and the head of an elephant between them. It is also observed that the cannon remains cool even in strong sunlight and when it is tapped it tinkles like a bell. Around the touch hole is the inscription of its maker. However, the original pivot and carriage are missing. It is placed on a *burj* (tower) on the northern wall of the fort and is one of the major attractions of Bijapur where a peculiar belief exists that touching the cannon and making a wish would make it come true!

It was in his reign that relations with the Mughal emperor Akbar were established and envoys exchanged. Ali Adil Shah had no son of his own. So, in 1579 he appointed his nephew Ibrahim, son of his brother Tahamasif, as his successor. Ibrahim was to become the most successful king of Bijapur and preside over an age that would see Bijapur become the honeypot that attracted bees from the world over. But, not without a healthy dose of drama.

If ever there was any question regarding the importance of queens in an empire, one need look no further than Bijapur. In



A vista of Bijapur from the Gol Gumbaz; the city was once a honeypot of riches, which attracted people from around the world

a history that is almost exclusively dominated by men, the queens of Bijapur in at least two instances saved the dynasty from being cut short. The very year Ali Adil Shah proclaimed his heir, he was assassinated by a eunuch. Ibrahim was installed on the throne as Ibrahim Adil Shah II. However, Ibrahim was still a boy of only nine years. His aunt, the wife of Ali Adil Shah - Chand Bibi - stepped into the foray where various forces through the office of the regent were attempting to usurp the throne. Through clever associations, calling upon old loyalties and great personal bravery, Chand Bibi saved the throne twice and then had herself installed as regent to the boy king whose name would become synonymous with Bijapur.

And the sun shines...

The dynasty in ascendancy reached its zenith in the age of Ibrahim Adil Shah, the second of his name but unparalleled in his family for vision, foresight and cementing together the best the fate and the trials of his ancestors had laid in his lap. He was undoubtedly Bijapur's greatest Shah who reigned from 1580 to his death in 1627. The greatest of Bijapur's monuments were built during his reign. However, what he is remembered for the most, his greatest contribution to Bijapur and the fabric of the Deccan was his wholehearted devotion towards fostering communal harmony across religions and sects. His policies and measures aimed at reconciling rifts between the Shia and the Sunnis of Islam and of both with the Hindus and his personality

was the personification of the values he held dear.

He patronised artistes like no other Deccani ruler, and the cultural flowering that was already under way by the crisscrossing of cultures and the additional influx of skilled artists and artisans from Vijaynagar, found means and resources to blossom into



The mosque at Gol Gumbaz



the city that came to be known as the Palmyra of the Deccan after the famed ancient oasis in the desert of present day Syria. Bijapur became as much a cultural melting pot as Akbar's Agra. The art form of the *mushaira* was born in his court and migrated to Agra.



Ibrahim himself was an accomplished artist. He spoke Marathi, Deccani, Urdu and Kannada, wrote poetry and was an exponent of the *Tanpura* which for him personified learning. He saw his city as a *vidyanagri* - a city of learning and publicly declared that all he wanted was *vidya* or learning, music and *guruseva* - serving the teacher. He claimed that his father was the divine *Ganapati* and his mother the holy Saraswati. In no field was his artistic acumen and secular leaning more true than in music. Ibrahim wrote a 59-song cycle in Deccani Urdu, set to Hindu musical modes, known as the *Kitaab-e-Nauras* (the book of nine essences/sentiments). It has verses dedicated to his wife Chand Sultana (not to be confused with Chand bibi), his Tanpura Motikhan and his elephant Atish Khan.

The Shah saw music as the synthesis that would unite his people and give form to his cherished ideals that would see Bijapur transcend definitions of capital into a veritable paradise. Much like Akbar, he too visualised a culture that was a fusion of all that existed in the land to unite the people in peace. In the north, Akbar built Fatehpur Sikri and tried to give a firm footing to his ideal of *Din-e-ilahi*, and in the Deccan, to give further impetus to his idea of a musical city, Ibrahim founded the musical city of *Navraspur* - the abode of the nine *rasas*. The township, a nine-gated pleasure capital built three kilometres from Bijapur city was built to invoke *navrasi* in all its philosophic and artistic meanings. At its centre was the Sangeet Mahal - a two-storey hall designed for musical



The arched entry into Navraspur

performances, which lies in ruins today.

Ibrahim's daughter was married to Daniyal - son of Emperor Akbar, that cemented a strong link between the two kingdoms and the peace further encouraged prosperity. Ibrahim came to be known as Jagadguru Badshah while he still lived, and left behind a trail of multi-ethnic culture and tales of resourceful leadership, whose design remains can be seen in what was once his capital city. The very quiddity of his philosophy is reflected in what is a marvel of architecture with no compare in history of India - his tomb - the Ibrahim Rauza (Rauza means tomb) - a complex with the tomb, a mosque, water tank built on a raised plinth. It is Deccan's Taj, though it was built years before Shah Jahan constructed the Taj. Perhaps, the name emerged as he too had it constructed for his wife, but got interred there himself. Unlike the Taj with its sophistication of clean lines and visible restraint, the Ibrahim Rauza is a riot of



Inside Navraspur

bulbous finials. It is decorated with clusters of false minarets interspersed with true minarets and is covered with calligraphic decoration of Qur'anic verse, Persian poetry and pious injunctions. While Islamic architecture has traditionally revelled in the use of geometric designs, the Ibrahim Rauza borrows heavily from the Hindu style of using objects of natures such as leaves, veils and flowers in its decoration.

The shadows lengthen

The seeds sown by Ibrahim Adil Shah II continued to bear fruit during the reign of his son Muhammad Adil Shah who ascended the throne on the death of his father in 1627. To be fair to him, the sixteen-year-old lad who would rule for 30 years carried forward the egalitarian society his father had envisaged and devoted his life towards. Continuing, also, in his father's diplomatic missions, Muhammad had great relations with the Mughal Emperor Shah Jahan. In partnership with the Mughals, the Sultanate of Ahmednagar was brought to an end and a peace treaty was signed with the Mughals that assured independence for Bijapur through a royal Mughal *firman*. Shah Jahan also formally recognised Muhammad as 'Shah' - the only Bijapur ruler to receive such recognition from the Mughals.

The Mughals were the preeminent rulers of the subcontinent and the peace with them assured a long term of life without aggression and prosperity for the dwellers of Bijapur. This extension of peace saw arts and culture flourish further where



The magnificent Navraspur sangeet durbar hall, in ruins today

Muhammad became the first Adil Shahi ruler to depart from the Islamic injunctions against figure and portrait painting, and he introduced frescoes and portraits which can be seen at the Asar Mahal - the hall of justice built by Muhammad Adil Shah which would also house hairs from the Prophet's beard. Traces of paintings and stucco work are also visible at the Saat-Manzil - a part of a mansion that remains and is now a five-storeyed dilapidated building.

Muhammad's military achievements are a mixed bag though and it is in this one can see the beginning of the decline of Bijapur. His reign also saw the emergence of the Maratha warrior Shivaji, whose initial Hindu State was carved out of Bijapur - a start that would have grave consequences for Bijapur very soon. The larger-than-life monuments and edifices which had become the hallmark of Bijapur architecture reached its zenith in the reign of Muhammad Adil Shah and is best evident in the tomb he constructed for himself - the picture postcard of Bijapur and an unquestionable entry in the list of monuments of Incredible India - the Gol Gumbaz.

Ingeniously built on a bedrock that would prevent shifting and tilting, the Gol Gumbaz is an intricately planned, a meticulously executed and elegantly finished monument of epic proportions and monstrous dimensions. With a dome that many reckon is the second largest in the world (after the St. Peter's Basilica in Rome), it is a tomb that announces its presence to visitors to the city 10 kms before they see Bijapur. Although considered to be simple of design and remarkably virile and

austere as opposed to the much more feminine finishes of the Ibrahim Rauza, it is widely regarded as the structural triumph of Deccan architecture. Within the same complex is also the Naqarra House that would once hold the drums that would welcome important visitors to the city and today is an excellent museum housing some of the best that Bijapur had to offer.

Eight intersecting arches created by two rotated squares that create interlocking pendentives support the dome. At each



The octagonal 7-storey tower of Gol Gumbaz, a tomb that is visible even 10 km from Bijapur



Saath Kabar, the burial place of Aurangzeb's general Afzal Khan's harem, a 'dark tourist spot'

of the four corners of the cube, is a dome-capped octagonal tower seven stories high with a staircase inside. The upper floor of each opens on to a round gallery which surrounds the dome. Running around the inside of the dome is the "Whispering Gallery", where even the softest sound can be heard on the other side of the mausoleum due to the acoustics of the space. It is an apt homage for the last great ruler of Bijapur who presided over its most prosperous time. From such dizzying heights of the Gol Gumbaz, things would only go downhill.

There must be dusk

After Muhammad's death in 1656, his son Ali Adil Shah II, a boy of 18 ascended the throne. This transition of a young, untested and weak ruler was the opportunity for the terrors growing in the dark during the reign of Mohammad to gain control over Bijapur. Bijapur was a rich fruit, ripe for the taking. In a few generations, it had become the envy of the world and an envy that the Mughal prince Aurangzeb would want to possess at any cost.

Besides the constant internal politics of gaining power, the Mughals too were looking for a reason to invade Bijapur and under the pretext of the legitimacy of Ali's parents, Aurangzeb pleaded for an attack that was approved by Shah Jahan. Simultaneously, an increasingly boisterous Shivaji was consistently taking territory away from Bijapur. It was his reign that saw the famous encounter of his general Afzal Khan with Shivaji at Pratapgadh which provided Shivaji with the means and resources to set up an empire as large as any seen in the subcontinent.

The Shivaji-Afzal Khan face-off, though, caused the creation of a tragic legend in Bijapur and a 'dark tourist spot'. Popular narrative holds that Afzal Khan was a superstitious man and relied heavily on the predictions of a Brahmin astrologer. Though he had shouldered the responsibility of subduing the 'mountain rat' Shivaji, he was tentative as the astrologer had predicted



The arches of the incomplete tomb of Ali Adil Shah II called 'Bara Kaman'

that Afzal Khan would never come back to Bijapur if he attempted to fight Shivaji. Afzal Khan is also portrayed as a jealous and possessive man who could not bear the thought that in case he never came back, his wives and quite substantial harem - a total of 64 women - would be with other men. Hence, he called them to a spot a little away from the city and drowned them in a well. One of the women, however, managed to run away. The other 63 were not so lucky and are buried near the well, at a place known today as 'Saath Kabar' (60 graves).

To be fair to him, Ali II ascended at a time which required a more experienced ruler. The tides were coming in too rapidly and from all directions. He was fighting on several fronts simultaneously against powers and motives that were in no mood for deals, negotiations or any half-measures. They were looking to go in for the kill - to possess the golden egg laying hen that was Bijapur. Through his 16 years reign, he repulsed the Mughals thrice, but lost territory each time. Similarly, territory was lost to Shivaji, and on his death in 1672 when he was buried at an incomplete ambitious tomb called Bara Kaman, Bijapur was already a pale shadow of what it was in his father's time.

An eternal night

In a line of young boys having to take the throne, Sikandar Adil Shah was a mere infant of four when his father died and



What remains of the old wall of Bijapur

his reign was one of changing regents and conspiracies and civil war like situations between warring nobles. It was only a matter of time before the Mughals would drive in the final nail. The process took longer than one might imagine and through all kinds of tactics, alliances - including one with Sambhaji, son of Shivaji - Bijapur held on to its independence for 14 long years when finally in 1685, Emperor Aurangzeb personally marched to the Deccan to fulfill his life's ambition.

On September 12, 1686, Bijapur was occupied and integrated into the Mughal Empire. In the Gagan Mahal built by his ancestors, a young Sikandar was brought bound in silver chains and he bowed thrice to Aurangzeb before being taken away to Daulatabad - a Mughal stronghold where he died in captivity.

Happily ever after

Colonel Philip Meadows Taylor, an Englishman in the service of the ruler of nearby Hyderabad in an 1866 publication, eloquently describes Bijapur as, "Palaces, arches, tombs, cisterns, gateways, minarets, ... all carved from the rich basalt

rock of the locality, garlanded by creepers, broken and disjointed by peepul trees, each in its turn is a gem of art and the whole a treasury."

The story of Bijapur runs like a fable. Like Arabian Nights, impossible seeming situations are the ingredients of which it is brewed, flavoured by the spices of wisdom that enlivened *Panchatantra* and the seasonings of wit that is resplendent in Aesop's Fables. Bijapur, the city might not have survived for an ever after. Indeed, it has been renamed to the original Vijayapura in 2014.

However, the Bijapur of Col. Taylor's experience, of Ibrahim II's vision and Muhammad's grandeur, the one where the domes of Bijapur offer a canopy of possibilities and a chance to experience paradise, that fable that is Bijapur, will live happily ever after... ■



The writer is a media professional and freelance writer.

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“While we do not have first hand evidence of corruption in the GM regulatory, there certainly is a conflict of interest.”

As an activist and convenor of ASHA (Alliance for Sustainable & Holistic Agriculture) **Kavitha Kuruganti** is deeply involved with the issues of farmers in India. Interacting first hand with the farmers and getting them access to markets is a cause that is close to her heart. She also spends time advocating sustainable agriculture and the need for greater awareness about Genetically Modified (GM) crops. In a conversation with **Disha Shetty** she discusses all that is wrong with India's agriculture system today, and how organic farming is the natural answer to the woes of the farmers.



Debate about the pros and cons of GM crops has raged for a long time now. What is wrong with India's current farming model?

We are at a juncture where there is tremendous degradation of natural resources. This kind of destruction of the environment impacts the livelihood of millions of people. The kind of agriculture that has been practised since the Green Revolution has left an impact on the health of the people. This is a good time for a decisive shift to a food production system that will be a win-win situation. While increasing the food production was the concern of the proponents of the Green Revolution, there is enough scientific research to show that you can take care of food production that is needed for our country. It does not make sense to grow GM crops here.

Often corporations are able to get away with unethical behavior in India. Why is that so?

Monsanto wants to introduce Bt maize in India as countries like ours and China offer huge potential for business. Companies for who profit is the bottom line, there is obviously a tendency to look at our market and even adopt unethical or sometimes

illegal practices. There is a lot of aggressive marketing which tells the farmers that GM crops are equally good for you. One side is laden with resources like PR fund and the other side does not have that kind of resources.

Informed public debate is an added challenge and the political class does not hesitate to compromise on public interest. While we do not have first hand evidence of corruption in the GM regulatory, there certainly is a conflict of interest. GM crops manufactures are themselves certifying their crops as safe. There is a lot of push from the corporations and lack of awareness among the public to assert their right. This is a potent combination.

Government is pushing GM crops in the country citing that it is important for food security. How accurate is this view?

It is ironical that in India, where we are sitting on tons of food grains that are left to rot and people starve, we are talking about GM being essential for food security. Our food production was always more than enough. These are just convenient arguments.

First let's be clear, GM is not a technology which has a capacity

to improve yields. Science of transgenesis has not progressed so much where you can modify multiple genes.

Some time back, around 200 scientists wrote to the government explaining how the argument was flawed. The letter was also used by the then Minister of Environment and Forests Jayanthi Natarajan to fight against NCP (Nationalist Congress Party) chief Sharad Pawar who was batting for GM crops.

What scientists had done was to give Natarajan evidence to show that countries where 60% of crops under production was GM, food insecurity had actually gone up. US, Argentina and Paraguay are examples that GM is not an answer. GM soy is the largest grown GM crop in the world and constitutes 70% or more of soy crops in plantation. Evidence suggests that it has not enhanced the yield, instead the yield has come down. It is important to understand that food security is also food safety.

Environment minister Prakash Javadekar has gone on record to say that there is no scientific proof against GM crops.

The government is being unscientific. They are repeatedly brushing aside evidence that does exist. Another aspect to this is that scientific evidence emerges depending on where funds are going. In India, ₹ 350 crore of public fund is being spent on developing GM crops.

We are not aware of a single project where money is being invested in research on biosafety. Several published papers show that there is evidence that GM crops are safe, but there is a conflict of interest about who funded/did the studies.

As a convenor of ASHA you interact closely with the farmers. What has been your observation with respect to their experiences with GM crops?

The largest number of farm suicides continue to be that of Bt cotton farmers. You can safely conclude that Bt cotton has not reduced, but exacerbated the crisis. The crops are risky as they require a lot of out of pocket investment for farmers. Seed is expensive and the crops require more inputs in the form of pesticides. Risk comes from the fact that Bt cotton is observed to be less stress tolerant, which is something the farmers cannot afford. Farmers did adopt Bt cotton on a large scale. That is an indication of how frustrated they were with pesticides. Bt cotton farms saw pest infestations in Maharashtra, Gujarat and Punjab, where farmers had to plough back the crops because the pest infestation was too high. We are talking about tens of thousands of crores of losses for the farmers. The seed companies never pay up.

What are the dangers of GM food that consumers remain unaware of?

Oil companies are allowed to blend around 30% of their oil with other types of oil. Even if the label says it is 100% rice

bran oil, there is a presence of other oil – generally of GM origin. People are consuming GM crops without knowing about it. Most of this is food imported from other countries as they don't have a law which requires them to segregate GM and non-GM crops. Popcorn, mayonnaise and even baby foods have ingredients which have GM crops. Nestle products were also found to have GM ingredients when Greenpeace tested it sometime back.

If the food is imported, then one must avoid buying anything that has soy, corn, canola or cotton seed extracts in it. When it comes to oil in India, the only way to avoid GM is to opt for edible organic oil. Organic in India has zero tolerance for any kind of chemicals.

You've spoken about how American corporates are pushing GM crops in India. What stand according to you should the Indian political class take?

Politicians have to prioritise public interest. There are state governments who are saying that they will not allow GM crops anywhere in the state. Kerala has expressly said GM will not be allowed. If the government shows the political will, then there are ways to move forward. We will also need public pressure and awareness among the citizens.

How do you look at the market for organic produce and what would you like to change in it?

Government is investing very little in the sector. We need more promotion of organic farming. We need citizens who can easily afford to spend a little more on food to buy organic produce. It goes a long way in incentivising the farmers. If farmers are paid better, they will certainly move towards better practices. The middle class behaviour of haggling for food prices should change. When you unhesitatingly pay for brands like Nike because you know that the quality is better, then you should also know that the quality when it comes to food also varies.

Farmers understand that chemicals are not good, but their knowledge about seeds is limited. They are taught that with this you don't have to use pesticides. It is important for farmers to start organising themselves. Unfortunately, their compulsions are such that they are unable to think beyond the immediate season.

Will shifting to organic produce and ensuring that farmers get access to markets improve the situation and bring down the large number of farmer suicides in our country?

Certainly. We don't have a single organic farmer who has committed suicide. Cost of cultivation comes down drastically with organic farming. For 50 years, in the name of Green Revolution, the country has geared itself towards only one kind of farming. Only organic farmers and NGOs are telling farmers about organic farming – no one else is. ■

Food so foul

*Contrary to belief, Genetically Modified foods are not safe to eat. While shallow, unethical studies touting their safety are often cited, **Claire Robinson** insists that GM foods are toxic. Till well-researched and impartial data validates GM food, should we take the risk of consuming it?*

WE are often told that there is a scientific consensus that GM (Genetically Modified) foods are safe to eat. A closer look at the evidence, however, shows that this claim is false. There is no such consensus – and a significant body of evidence shows that GM foods can be toxic or allergenic.

Some of this evidence is collected in the book I wrote with two genetic engineers, *GMO Myths and Truths*. Peer-reviewed, animal feeding studies show that a GMO (Genetically Modified Organism) diet can cause health effects such as immune responses, liver and kidney toxicity, and abnormalities in the gut, pancreas, and blood. No study finding a problem with a GM food or crop has ever been replicated. The standard response has been to sweep the findings under the carpet. In several cases, the researchers who carried out the experiments have been attacked in seemingly orchestrated smear campaigns. Some have paid with their careers and funding.

A smorgasbord of unethical practices

GMO industry does its own safety testing: GM foods are tested for safety before commercialisation by the same companies that stand to profit from their sale – a recipe for bias. Typically, such studies are conducted on rats for a maximum of 90 days, a small fraction of the rat's natural lifespan of three years. This is too short a period to detect long-term health effects.

Even with these limitations, some industry studies have revealed problems in GM-fed animals. Monsanto's tests with GM Bt maize were re-analysed by scientists, who reported toxicity in the liver and kidneys of the GM-fed animals. In trials commissioned by Mahyco, Monsanto's Indian partner, rats fed GM Bt insecticidal brinjals suffered organ damage, according to epidemiologist Dr. Lou Gallagher, who analysed the studies. Gallagher commented, "Release of Bt brinjal for human consumption cannot be recommended given the current evidence of toxicity to rats in just 90 days and the studies' serious departure from normal scientific standards."

Nonetheless, similar Bt brinjals have been released in Bangladesh and sold unlabelled in markets. Now the Indian government is considering releasing a GM mustard, for which no thorough toxicity testing appears to have been done.



A GM corn field in the United States: What will be the impact on health?

Few long-term studies: Adverse effects seen in short animal feeding studies with GMOs are often dismissed as unimportant, without scientific justification. The only way to know whether the effects matter is to extend the study length and see if initial changes develop into serious disease. This is hardly ever done. Many scientists have criticised the lack of long-term feeding studies on GM foods. One review stated that "serious debates" about effects found in long-term and multigenerational feeding studies remain. Another noted, "As these foods are new inventions, not much is known about their long term effects on human beings".

GMO proponents claim that long-term feeding studies on GM crops abound. They cite an article that reviews supposedly long-term animal feeding studies on GM foods and concludes that they are safe. But many of the studies are not long-term, in that they only lasted for a small fraction of the animals' natural lifespan. Some of the studies found problems in the GM-fed animals, which were dismissed by the review authors. And the authors used unscientific double standards to dismiss findings of toxicity from GM foods as unreliable, while findings of safety are accepted at face value!

The "trillion meal study": Another scientific article was touted by one GMO proponent was the "trillion meal study" that proved GMOs are safe to eat. The article, co-authored by a former Monsanto employee, analysed 28 years' worth of field data on 100 billion farm animals from before and after the introduction of GM feed in the USA. The authors concluded

that there were no adverse effects from GM feed. Yet, the data was completely uncontrolled. There is no way of knowing how many animals ate GMOs, for how long, and in what proportion of their diet. Over 90% of the data were on 49-day-old chickens. These data tell us nothing about long-term health risks to humans or other mammals.

French agency confirms lack of long-term studies: The scarcity of long-term studies with GM foods has been confirmed by the French food safety agency ANSES in a review of the scientific literature for long-term studies on herbicide-tolerant GM crops, which make up over 80% of all GM crops. The agency found only two studies. One reported health problems in mice fed GM soybeans. Another found no problems in rats fed GM glyphosate-tolerant soybeans. However, the soybeans do not appear to have been sprayed with the herbicide in line with usual farming practice, as glyphosate was only found at the limit of detection. This is not normal, as GM glyphosate-tolerant soybeans have been found to contain high residues of glyphosate, a chemical that has been declared a “probable human carcinogen” by the World Health Organization’s cancer agency IARC (International Agency for Research on Cancer).

Herbicide cocktails: The issue of herbicide residues in GM crops will become increasingly problematic. Widespread spraying of GM crops with glyphosate herbicides has led to the spread of glyphosate-resistant superweeds. Industry’s answer has been to engineer GM crops to tolerate other potentially even more toxic herbicides, such as 2,4-D, an ingredient of Agent Orange. No proper toxicity testing has been carried out on these chemical cocktails.

Appeal to authority: GMO proponents often appeal to authority by stating that eminent scientific organisations agree that GM foods are safe. But this claim is fraudulent and misleading. Many of these bodies issued nuanced statements that do not suggest all GMOs are either safe or dangerous.

A statement (issued by the American Association for the Advancement of Science (AAAS), then headed by GMO promoter Nina Fedoroff, did claim that GMOs are safe and opposed mandatory labelling in the USA. But it was condemned by 21 scientists, including members of the AAAS, as “an Orwellian argument that violates the right of consumers to make informed decisions”. The scientists warned that the herbicides with which GMOs are grown “may induce detrimental health effects even at low exposure levels”.

Over 120 health-related organisations do not agree that GM foods are safe and/or support mandatory labelling. They include the American Public Health Association (APHA), the British Medical Association, and the Public Health Association of Australia. In any case, ‘expert’ opinion is only as reliable as the data on which it is based, and the data is inadequate.

What eminent scientists said

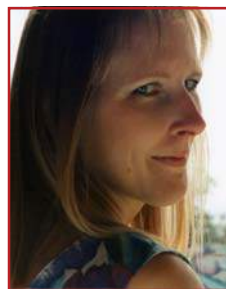
In 2015, over 300 scientists signed a statement titled, “No scientific consensus on GMO safety”, which was published in a peer-reviewed journal. The statement concludes, “The scarcity and contradictory nature of the scientific evidence published to date prevents conclusive claims of safety, or of lack of safety, of GMOs. Claims of consensus on the safety of GMOs are not supported by an objective analysis of the refereed literature.”

Attempts to marginalise these scientists by likening them to deniers of man-made climate change, are dishonest. The main connection between climate change and GMO safety is that corporate interests and their scientific allies have misled the public on both. And several prominent GMO lobbyists are also climate science deniers.

Americans as guinea pigs

It is often claimed that Americans have been eating GM foods for years with no ill effects. But this statement is scientifically nonsensical, as no epidemiological studies have been carried out on humans eating GM foods. What is known is that Americans have got markedly more sick since GM foods were introduced in the mid-1990s. Is there a link to GM foods? There is no way of knowing. GM foods are not labelled in the US, so any increase in disease cannot be traced back to them.

To paraphrase Jose L. Domingo of the Faculty of Medicine and Health Sciences at the Rovira i Virgili University in Spain, when it comes to health risks of GM foods, there are “many opinions, but few reliable data.” ■



The writer is Editor at GMWatch.org and co-author of *GMO Myths and Truths: A Citizen's Guide to the Evidence on the Safety and Efficacy of Genetically Modified Crops and Foods*.

Word of wisdom

Manliness consists not in bluff, bravado or lordliness. It consists in daring to do the right and facing consequences whether it is in matters social, political or other. It consists in deeds, not in words.

– M.K. Gandhi (1929)

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A tale of ineptness

The attack on India's Pathankot Air Force base by terrorists based out of Pakistan, was a failure at many levels. Not only did we suffer casualties despite prior intelligence warning, but the handling of the crisis left a lot to be desired, says Lt. Gen. Vijay Oberoi. When will India learn her lesson?

FOR India, the new year dawned differently. While the world welcomed the new year with cheers, all round revelry and popping of champagne bottles, it brought betrayal, deceit, fraudulence, perfidy and breach of solemn promises made by the Prime Minister of Pakistan to our Prime Minister repeatedly, that *jihadi* terrorists would not be permitted to operate from Pakistan and attack targets in India. I am referring to the attack on the Indian Air Force (IAF) base at Pathankot by terrorists of Jaish-e-Mohammad (JeM) from Pakistan. While the terrorists did not succeed in their nefarious mission, it has undoubtedly brought to the fore the gross ineptness of both persons and institutions that deal with security issues of our nation. This ineptness was at all levels, from the very top to the lowly but brave soldiers, who once again proved that even when the higher ups botch up everything, they readily sacrifice even their lives and do not shirk from their duty and responsibility. In the aftermath, instead of taking the culprits to task, cover-ups are already underway to shield loyalists and look for scapegoats.

Was it narco-terrorism too?

Although the media has carried considerable reports about this terrorist operation, it is necessary to highlight some important aspects. It is fairly clear that the attack was mounted

to derail the so-called peace process between the two countries, when for the umpteenth time, India extended its hand to normalise relations with its neighbour. Unlike earlier occasions, the attempt at disruption came much earlier than in the past, indicating that nothing really has changed among those in Pakistan, who for their own reasons of retaining power do not want a rapprochement, even when the Pakistani Awam desires it.



The Pathankot Air Base attack came on the heels of PM Modi's impromptu visit to Pakistan

I am firmly of the view that it is narco-terrorism that was fully and deeply involved in making this attack possible for the JeM terrorists. Many Border Security Force (BSF) and Punjab Police personnel are in cahoots with smugglers of both sides and are deeply involved in smuggling of narcotics from Pakistan. I believe that the nexus extends all the way up to a few ministers of the Punjab government, if not higher. All facets of the incident involving the Gurdaspur SP (Superintendent of Police) Salwinder Singh, particularly the fact that he and his companions were not killed are pointers to the deep involvement of the

JeM and by association, the Pakistani ISI (Inter-Services Intelligence) in making use of these collaborators for terrorist action in India.

The Pathankot attack is one instance when sufficient clues, evidence and information about the high probability of a terrorist attack were not just available, but even the target was broadly identified. In addition, sufficient time and more important, a well-trained force was readily available to foil the likely attack. The National Security Adviser (NSA), having received most relevant information from more than one source did not even think of calling the experts in counter terrorist operations (the army units next door), but chose to airlift a small team of NSG (National Security Guard), trained for tackling hostage

situations and anti-hijacking operations, and not flushing out terrorists. The army formation next door was the ideal force available. It had senior and well-trained command, control, communications and staff available and it had well-trained and equipped troops, readily and immediately available to foil and flush out the terrorists.

Information available in the public domain also states that the decision taken was in a meeting of the so called 'core group' that gets activated in such situations. One can understand that the civil officials who form part of the group may be somewhat naive about security

issues and are more concerned about ensuring that no blame comes to them later, but it is baffling that the three Service Chiefs and particularly the Army Chief, who were also present, went along with this peculiar decision.

Ego at work?

Maybe the major reasons for the NSA to take such a decision were one or all of three, viz., 'ego' to show himself as a better professional than others; deliberately belittling the only force that matters in our country, viz., the army to tackle such challenges; and taking credit later by proving that a force under the Ministry of Home Affairs (MHA) was as good, forgetting that the cutting edge of the NSG also consists of only army personnel, albeit curiously commanded by a police officer! Whatever the reason, the nation then found itself looking at a situation where a whole division or more of well-trained and equipped force was left cooling its heels next door in Mamun Military Station, while an assortment of Defence Security Corps (DSC) personnel, meant for static guard duties; a few Garud Commandos of the IAF, who are not tasked for such roles; sundry personnel of the Punjab Police, some armed and others with only their *dandas* (baton); some elements of the BSF, whose role is guarding the border; a few intelligence personnel from a number of intelligence agencies (whose role I am unable to comprehend); and sundry others were sent to Pathankot.

The moot question is, whether the nation should continue to have a person who cannot discern even roles and tasks of various security forces to continue in that position? Maybe, this is an irrelevant question in a nation where important appointments are made not on account of ability and capability but based on loyalty, willingness to compromise and having other such traits.

The Base Commander of a sensitive operational base is always specially

selected for his professionalism and leadership qualities. This was also the case for the Pathankot Air Base. However, when a leader with such great responsibility is confronted with a challenge of the type that had presented itself, he needs space; interaction with his command to formulate plans and monitor execution. However, if senior brass lands up at his base, ostensibly to help or for any other inexplicable reason, they are bound to curb the style of the commander and draw his attention away from the task at hand. This is exactly what happened, as senior officers started landing in sundry aircraft and other vehicles, which included the Commander in Chief of the Western Air Command and many others. Notwithstanding the botched up decision making in Delhi, unfortunately, in the heat of excitement or a myriad other reasons, some senior brass forgot the basic teaching drummed in to them for years, which is to let the commander on the spot handle the situation and not breathe over his shoulder. Many of us, either for ego, glory or other similar reasons, forget this golden military rule.

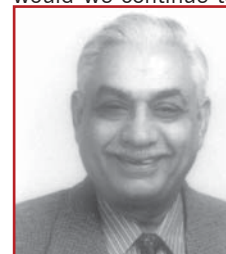
It was the same case with the DG (Director General) of NSG, who also landed up there, maybe for similar reasons. Some of you may remember that the police officer who was the DG at the time of the 26/11 terrorist attack in Mumbai had done the same, and proved to be a major hindrance in the conduct of those operations.

The shemozzle of wrong decisions taken at Delhi was eventually corrected after we suffered many casualties and had dollops of sheer luck, but can we or should we depend on luck? These types of situations are highly serious and sensitive, where if SOPs (standing operating procedures) are not followed for extraneous reasons or for seeking personal glory, then after-the-event cover ups always start so that the blue-eyed boys can be extracted from their

ignominious decisions. Accountability is unfortunately an alien word in the system the government follows in our country. Whether it was the debacle of 1962, or the widespread bomb blasts on a number of occasions in Mumbai, or after the Mumbai mayhem of 26/11, no one was apparently accountable! The *sarkari* media and the 'paid' media are already working speedily to shift focus away from the highly unprofessional way the *maharathis* of Delhi handled the entire crisis.

This piece would be incomplete if one does not bring out the inaction or the non-action of our elected political leaders dealing with security affairs. Apparently, the cabinet did not meet for six days and the senior ministers concerned with security issues found many other engagements that kept them away from Delhi! The Prime Minister's visit now had little meaning except perhaps to show that he still had confidence in his *maharathis* whom he had taken along for the photo-ops. When insurgency/ terrorism was at its height in the early years of the 1990s, we in the army used to have a plethora of data to get an overall picture of how our troops were performing. One of these categories was the ratio of casualties of the troops vis-a-vis the insurgents. I do recall that we always had a favourable ratio, which gave a good idea of the gains we were making. It is sad and disheartening that even after prior knowledge was available, the ratio of casualties is in favour of the terrorists in this terrorist attack.

When will we learn lessons and when will they get implemented, or would we continue to rely on lady luck to come to our rescue? Your guess is as good as mine! ■



The writer is a former Vice Chief of Army Staff.

What use this bonhomie?

The attack on the Pathankot Airbase following PM Modi's impromptu visit to Lahore has many lessons for us, says P.M. Kamath. More than Modi's personal diplomacy, the need of the hour is decisions based on focused deliberations, he avers. We must also insist that Pakistan hands over the Pathankot attack mastermind Masood Azhar.

PRIME Minister (PM) Narendra Modi by his decision while in Kabul to visit Lahore and join Pakistani PM Nawaz Sharif in the wedding celebration of his granddaughter on December 25, 2015, painted a masterstroke in personal diplomacy. If that was a genuinely spontaneous development, unplanned and un-designed, it was really a genius move. Incidentally, personal diplomacy is a modern development where the head of state or the head of government conducts diplomatic negotiations.

Personal diplomacy is normally built around certain personal or social occasions. The very fact that both the PMs after their successful meeting on the day cautioned the general public not to expect dramatic changes in India's Pakistan policy or Pakistan's India policy, shows they expected hurdles.

Lahore visit - gains and losses

Undoubtedly, the dramatic visit led to the growth of personal bonhomie between the leaders of the two adversarial states. Many have hailed Modi for his bold decision to visit Lahore. All those who have hailed it have a stake in lasting peace that could emerge from the success of such personal diplomacy. But has it contributed to improving India-Pakistan bilateral relations? Obviously not; because hatred generated since Partition cannot be wiped off with one act of personal diplomacy, particularly hatred based on religious differences, and not political ideologies. Even then,



PM Modi's impromptu visit to Pakistan set a new standard in personal diplomacy. But is this enough?

gains could be found, if unforeseen factors do not disturb the flow of events.

For India, the desperate issue is to find a solution to Pakistan's promotion of cross-border terrorism. That is directly related to India's economic development, achieving peaceful political conditions in the country and the region, and promoting social harmony nationally. But Pakistan has linked terrorism to resolving of dispute over Jammu & Kashmir. Earlier, it had the option of starting conventional war by stealthy means. Today that option is ruled out for Pakistan as well as India, because of possession of nuclear weapons. The possession of nuclear weapons has given rise to terrorism as an instrument of foreign policy for

Pakistan, a weak nation, as opposed to India, a rising major power.

Hence, pessimists use the failure of similar earlier efforts in search of peace, to argue nothing good could emerge from a repeat of such efforts. Let me limit to experiences gained since former prime minister A.B.Vajpayee's efforts to improve relations in 1999. His Lahore Yatra generated hopes for good neighbourly relations. But they were frustrated by General Musharraf's Kargil misadventure. For Manmohan Singh it was a personal one-point goal since 2004; but it was destroyed by the 26/11 sea-borne *Lashker-e-Toiba* terrorist attack on Mumbai, with the blessings of the Pakistani Army and its ISI (Inter-Services Intelligence).

Yet, those who call it as a mere stunt are wrong, as the meeting at Lahore has come after earlier brief meetings between the two at Modi's May 2014 swearing-in, at Kathmandu SAARC meet, the meeting at Ufa in Russia, and the follow-up by National Security Advisers (NSAs) of the two countries in 2015.

Members of the main opposition party, the Congress, have criticised PM's visit by alleging that there is no consistency in Modi's Pakistan policy or there is a U-turn in it. Consistency is not necessarily a virtue in foreign policymaking; and leaders change their opinions on issues once they come to occupy a responsible position in governance.

Wasn't it also the characteristic of UPA led by the Congress under Mrs. Sonia Gandhi-Dr. Manmohan Singh rule? Classic example is; soon after 26/11, Manmohan Singh not only suspended the ongoing Composite Dialogue but informed Pakistan that terror and dialogue cannot go together; but as admitted, albeit indirectly, under American pressure, at *Sharm el Sheikh* the joint statement issued by him with Pakistani PM, Gilani after NAM summit in July 2009 said: "Action on terrorism should not be linked to the composite dialogue process..." One can give many other examples from democracies globally, but one should suffice. Candidate Richard Nixon and his Republican Party too were critical of Lyndon Johnson's efforts to end the Vietnam War in 1968, but once in office Nixon used the Vietnam peace negotiations to win a second term!

The Congress hasn't accused the BJP PM, nothing of the kind so far! On the other hand, PM Modi's hard line in the beginning in refusing to negotiate with Pakistan when it appears to take instructions from the Huriyat leaders, has permanently succeeded in denying



Jaish-e-Mohammed leader, Maulana Masood Azhar, is the mastermind of the Pathankot attack. Will Pakistan yield him to India?

an apparent role to them in the Kashmir dispute.

Attack on Pathankot Airbase

However, focus shifted from PM's personal diplomacy to cross-border terrorist attacks again. This should have been anticipated since there is a set pattern of terror attacks, though actors keep changing. This time it was by Pakistan-based, ISI-created Masood Azhar-presided, Jaish-e-Mohammad attacking Pathankot Airbase. It is in the similar mode of July 2015 Gurudaspur attack by the same terrorist group that occurred soon after two PMs had met for Shanghai Regional Cooperation meet at Ufa in Russia. The government should have been far more alert since in Ufa PMs had met in a foreign country, while in the latest case, the Indian PM visiting Pakistan had drawn considerable regional and international attention for Pakistani terrorists to strike at India to neutralise any impact on Pakistan's foreign policy.

Pathankot is more than 500 km inside Punjab from the international border. The Indian government made claims that they had intelligence on a likely attack on the airbase. They claimed to have alerted local population

to close shops early by 6 pm. Punjab's deputy chief minister has said that at least 20 hours before the attack the state government had alerted all relevant authorities on the likely attack. Thus, even a layman with rudimentary knowledge would ask: Why didn't Indian authorities sanitise and increase security rings around the outer periphery of the airbase? India-released terrorist, Azhar, has ridiculed Indian authorities for not knowing how to handle six terrorists for over 85 hours! This only shows that the Indian security establishment has not learnt any lessons after the 26/11 Mumbai terrorist attacks, even after seven years and spending crores on making India more secure!

In the aftermath of the Pathankot terrorist attack, Indian citizens felt that the Indian leadership was struggling to determine its response to terrorism emanating from Pakistan. Finally, it did demand action on the part of Pakistan against Masood Azhar. PM Sharif presented a semblance of unity within the government in Pakistan and announced that the government condemns the Pathankot attack, and reiterated the country's commitment to try to end terrorism!

(Continued on page 51)

True cinema

*A democracy is where there is space for every kind of voice to be heard. Take for instance, the experimental film festival organised in Kolkata, second year in a row. This festival gives space to all kinds of cinematic voices, says **Shoma A. Chatterji**, as she describes how this festival came to be, and why it's imperative that it continues.*

THE feature film and documentary cinema industry is too structured and straitjacketed to allow for much pushing of borders to embrace new ideas of expression and experimentation. Besides, these industries – corporate films, feature films, documentary films, educational films and commercial ads are constricted and controlled to a large extent by production houses, distribution networks and exhibition networks in an ambience that is predominantly patriarchal. In the changing scenario, the entry and percolation of video and digital is allowing a range of economically viable experimentation through the audiovisual medium for any and every present and potential audience. “However, digital is yet to attain the qualitative excellence of celluloid so we have a new kind of image in terms of tones, texture, etc., that are producing a new aesthetics that is leading to the creation of a new kind of cinema,” says



The Common Task, a film screened at this unique festival

Madhuja Mukherjee who has created an international experimental film festival that is as amazing in its range as it is in its expressive potential.

Madhuja, who teaches Film Studies at the Jadavpur University and is also

an experimental filmmaker and an installation artist who uses cinema in different and novel forms, says that the whole idea of the festival “was prompted by my experiences at the Rotterdam Festival in 2012 and my own inclination towards making experimental films. I needed a framework and the TENT (acronym for ‘Theatre for Experiments in New Technologies’) project is geared towards creating an interactive platform which will encourage, train and support inter-media artists and experimental filmmakers to expand the existing frameworks of arts packages.”

The festival also included two different and disparate installations that widened the canvas of the word ‘cinema’ to reach out to implicate larger



Films came from Germany's Berlinale Forum

Madhuja's curatorial project

National Instruments Limited (NIL) was a public sector company located in Jadavpur, Kolkata. It was engaged in the design, development, and manufacture of fine opto-mechanical and opto-electronic instruments for a variety of end-users.

In 1992 however, NIL was registered as a sick industry. At its peak, the spacious premises, covering about ten acres of land, is said to have hummed with the activity of about two thousand workers. NIL "entered its twilight" in the late eighties, and manufactured a range of products like infra-red search lights, passive binoculars, theodolites, and night vision optical devices - for the army.

In 2003, all production stopped. In 2009, Jadavpur University acquired the land, and the Media Lab, Department of Film Studies, embarked on the documentation projects. A number of artists recorded sounds, videos, and captured stills, quite a few installations and films have emerged out of the massive work done so far. This project highlights primarily three resources – Nikhil Arolkar and Avik Mukhopadhyay's stills, and Ankur Das's film - to create a zone that persists on the thin line between history and amnesia.

It explores NIL's sudden and unexplained closure. Therefore, when researchers from the University entered this space, NIL appeared to be sleeping, wrapped in layers of dust and enclosed in junk machines and objects which were both personal and intimate. The installation pushes the envelope in an attempt to remind that contemporary development is marked by many unspoken stories of under-development. ●



Madhuja Mukherjee, the curator of the festival

issues of language, form, and more importantly, technique specially with the rapid strides technology has brought into cinema. One of these installations is called *Chromozone by Taxi* created jointly by Suman and Saurav. It is an interactive installation that produces a cinematic environment by using projection and light installations that gets an added dimension when viewers are encouraged to traverse the space and click "selfies". Madhuja's own installation which was on show at the festival is a very interesting curatorial art project (See box above).

Films came in from the Berlinale Forum (Germany), from India Foundation for the Arts (Bangalore), and from Difference Screen (UK). 'Memory of North East', a section of films exploring different manifestations of love, another section called 'Kolkata Shorts', one called 'City Videos' and a few award-winning films from the Film and Television Institute of India, Pune, were among other individual explorations. For the purposes of screening also, the organisers are looking at informal, personal and individual spaces that would lend themselves better to this

kind of cinema where technique is the agency, the strategy, the means of expression, the form of content creating a completely new language in cinema. This also precludes every kind of censorship and commercial compromise.

Challenging the "Friday release" formula

Her definition of experimental cinema is, "Anything that challenges the 'Friday Release' framework. It is any cinema that is produced independently, that deviates from classical narratives, that detracts from preconceived dimensions of footage and aesthetics." In other words, an experimental film is that which is ideologically challenging that includes features, shorts, video art, playful documentaries and any form that forces us to see the world of cinema from a completely different perspective. For, this annual festival is run on almost zero budget, where everyone pitches in through volunteering both service and kind such as venue, screen, video or digital projector etc. Madhuja herself made an experimental film called *Carnival* that was part of the competitive section of the OSIAN Festival held in Delhi some years ago. The film went over the heads of the viewers because it was born ahead of its time.

What exactly does "experimental cinema" signify? Some answers to this question came across through many of the films chosen for screening at the 2nd Little Cinema International Festival for Experimental Films and Media Art that concluded in Kolkata recently. The scepticism and nervousness among the audience was soon dissipated by the way the films unfolded in terms of narrating an experience, a perspective, an ideology through technique, instead of through story or character or a linear structure.

Madhuja and her friends and



Film *Manas* was one of the entries

volunteers who worked on this project ceaselessly for months on zero budget decided to call it a 'little' festival because, according to Madhuja, "It draws from the concept of the 'little' magazine" which is outside the mainstream and brings together emerging artists. "In a manner of speaking, the little experimental film is an ideological alternative to mainstream publications, small budget and so on. Our focus is on experimental films and new media art," she adds.

The small packed theatre with cine buffs sitting on the floor in the aisles for every screening from 3rd to 9th December is proof that this festival will soon transcend the confines of "little" to become a big annual event. This year marked the second tribute to the world of experimental cinema. The Festival was organised by TENT in collaboration with Goethe-Institute/Max Mueller Bhavan, Studio 21, India Foundation for the Arts, Unbound Studio and Difference Screen. The longer films, most of them ranging between 15 and 80 minutes were screened at the Max Mueller Bhavan, while the very short ones spanning one to six minutes of screening time, were

screened at the heritage home of a historian in South Calcutta.

Why TENT?

The word TENT is both an acronym as well as a metaphor. "Tent" is a very old concept that dates back to the

The small packed theatre with cine buffs sitting on the floor in the aisles for every screening from 3rd to 9th December is proof that this festival will soon transcend the confines of "little" to become a big annual event. This year marked the second tribute to the world of experimental cinema. The Festival was organised by TENT in collaboration with Goethe-Institute/Max Mueller Bhavan, Studio 21, India Foundation for the Arts, Unbound Studio and Difference Screen.

time and place where earliest Indian films were screened in improvised and temporary screening platforms within a tent. Tent also has direct associations with circus performances that aim at mass entertainment. In this case of experimental cinema, this is cinema on the fringes of creating a new window to read and understand and interpret cinema through technology. Tent also stands for theatrical space for experiments in new technologies.

"We are currently making losses, but we have infrastructural support from edit labs and publicity companies. Besides, Studio 21 and Max Mueller Bhavan have supported us with their infrastructure and so has IFA, Difference Screen and Unbound Studio with their packages," Madhuja elaborates.

This focus on technology is traced back to the new technology science and modern practices have brought in, which is "at the same time, a very democratic and flexible technology open to several interventions, mainstream and conventional cinema making techniques do not offer. Women's interventions get a wider opening and so do the works of technicians and film practitioners who did not have either the funding or the technology earlier to venture into cinema as a form of creative self expression that may redefine the language and form of cinema in a new way," Madhuja sums up. ■

The writer is a freelance journalist, film scholar and author. She has authored 17 published titles and won the National Award for Best Writing on Cinema, twice. She won the UNFPA-Laadli Media Award, 2010 for 'commitment to addressing and analysing gender issues' among many awards.



She is currently Senior Research Fellow, ICSSR, Delhi, researching the politics of presentation of working women in post-colonial Bengali cinema 1950 to 2003.

When science met curiosity!

*IIT-Bombay's annual Science and Technology festival - Techfest - managed to bring some of the biggest and the brightest names in the world of science to address curious and eager students. **Disha Shetty** reports.*

QUEUES that stretched for almost a mile where students, parents, teachers and curious visitors stood patiently for their turn to attend not any entertainment show, but lectures and exhibitions! That's the pull IIT-Bombay's annual Science and Technology festival - Techfest - has. The three days from December 26-29 at the institute's Powai campus saw a staggering footfall of 1,65,000.

So what was in store for those attending the festival at the sprawling, huge and green campus of one of the country's premiere science institutes?

There were lectures by luminaries like the former chairman of Indian Space Research Organisation (ISRO) Dr. K. Radhakrishnan, and 2012 Nobel Prize winner in Physics Prof. Serge Haroche, workshops in cloud computing and exhibitions where all-terrain robots were on display, among other fascinating exhibits. The festival has grown to become so popular that it saw students from around 2,500 colleges participating in various events.



A robot playing soccer! Many such innovations were on display

But all was not only serious at this festival. Robowars, the event that draws massive crowds every year had robots, built and controlled by students, in deadly combat with each other. The winning robot was cheered and admired for its design and style by those gathered to watch the thrilling event. At the full throttle event, student participants were given an opportunity to build their own IC car that travelled across various terrains. While some stopped midway, others crossed the finishing line to loud cheers!

The popular exhibits

A gleaming BMW, but you cannot touch it: Those not headed to the heavy worded lectures and the technical workshops made their way to the



The visitors couldn't resist getting close to the BMW i8 at the Techfest

Student speak

The exhibitions that showcased cutting edge technologies continued to be the highlight of Techfest 2015, apart from lectures from eminent personalities Eric Klinker (CEO, Bit Torrent) and Nik Powell (Co-founder, Virgin Group).

Talking about the takeaway from the festival, Anuraj Gupta, a 3rd year student of Mechanical Engineering at IIT-B says, "The festival was a huge platform where I could showcase my managerial skills, and it provided me with a great experience of team-work."

Techfest this year entered the Guinness Book of World Records for the largest number of magic lessons learnt by most number of people simultaneously.

The festival also hosted an International Summit that was attended by delegates from Microsoft, IBM, Qualcomm and other tech giants who spoke about the theme 'Internet of Things'.

Gupta believes that the festival was a good opportunity for students to hone various skills that would help them at different stages of campus placements.



An IC car that was built by the participants at the 'Full throttle' event

exhibition area. The most popular exhibit was easily the bright, blue, gleaming BMW i8 car that can go from 0 to 100km/h in just 4.4 seconds. The car had even the little kids tagging along with their parents, excitedly.

Robots that play football: Not just humans but robots too can

play football. Dutch Nao Team from Netherlands brought along their robots that demonstrated just that.

This robot gets angry: Facebook founder Mark Zuckerberg has said that he would like to employ a robot to be his assistant to manage his home and work, calling it his personal project for 2016.

Well, he can spare himself the effort and look only as far as Switzerland. The team Jinn Bot from the alpine country brought with it a robot that can hear and speak. What's more? It has its own personality and can even express moods such as joy and anger!

There were also enchanting events by international artistes, mesmerising setups, whacky competitions - all with a tinge of technology to liven up the three days. During his speech, Prof. Haroche stressed on the need to be curious and invest money in sustaining basic scientific research as it eventually leads to innovations one would have never thought about. This is also a message the annual festival wants students to

learn – stay curious. ■



The writer is a young journalist who has recently discovered the joys of travelling.

What use this bonhomie?

(Continued from page 46)

Conclusion

Many are not willing to buy that 'spontaneity' was behind PM's visit to Lahore. The two PMs had met at least thrice before. But PM Modi ought to have made it a summit meeting with adequate preparations, rather than a personal diplomatic visit.

The federal government has to take following urgent steps to retrieve lost gains. It is time to make international terrorism an act of war and take all necessary consequential steps to implement it. Since Masood was handed over to Pakistani promoted terrorists responsible for hijacking the Indian Airlines plane in December 1999, India can now ask for him to be handed back to stand trial in India.

Third, an appropriate enquiry has to

be instituted into the Pathankot attack. Unlike in the 26/11 investigation, where focus was only on the police role, politicians and bureaucrats have to be made accountable. Fourth, in the aftermath of the airbase attack, it is a good idea to create a Department of National Security. But that alone is not enough. The Indian Army Chief General Dalbir Singh has called for India "to change its security policy towards Pakistan." The Americans may appreciate resilience of Indian society, but as a state aspiring for major power status, we will only experience global derision.

Finally, such a policy cannot be arrived at by PM Modi deciding it in consultation with his NSA; or Defence Minister visiting arena of terror and Home

Minister reiterating his determination to fight against terrorism - all in isolation. Need is for the revival of the National Security Council taking decisions after deliberations based on policy options. These steps are essential if Modi desires to make India a major power. ■

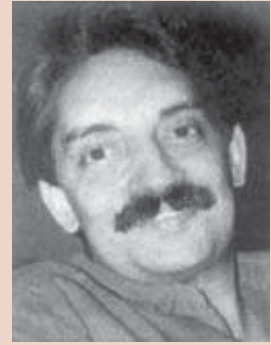
Dr. Kamath formerly Professor of Politics, Mumbai University is currently Hon. Chairman & Director, VPM's Centre for International Studies (Regd.), a Mumbai-based think tank affiliated to Mumbai University and Adjunct Professor, Department of Geopolitics and International Relations, Manipal University, Manipal. He has the unique credit of guiding a Ph. D. thesis on *Terrorism: An Instrument*



of Foreign Policy, with reference Pakistan's use of it in Punjab and J & K. He has also authored several papers and articles on various facets of terrorism.

Magical mushrooms

Did you know that mushrooms are fungi, in the same category as the one-celled yeast or the mildew that sprouts on your shoes in the damp? They have an important role to play in our ecosystem.



Bittu Sahgal
Editor, Sanctuary magazine

LEAVES are the world's oldest factories. They contain the green pigment called chlorophyll, which, along with sunlight, helps them manufacture their own food. Plants can therefore be called producers. Animals, on the other hand are consumers. And there are other living things, such as fungi, which are neither producers nor consumers. What part then do they play in nature's purposeful web?

Fungi are plants – although they lie in a separate kingdom from true plants. They are very simple, non-flowering plants that lack true leaves, roots and a stem. By secreting certain enzymes, fungi break down substances to get food. This makes them reducers, and they are perhaps the most important inhabitants of damp, woodland soil, as they help in humus-formation.

You must've all seen mushrooms – those little umbrella-like things that often seem to pop up overnight, out of nowhere on the forest floor or on tree stems, making them seem almost 'magical'. Though mushrooms are the best-known fungi, the minute, one-celled yeast that causes fruit juice to ferment and the bread in your home to rise, is also a fungus. The tiny mildew that sprouts on your shoes and other leather articles during the monsoons is also a fungus. And the mold that forms on rotting fruit is fungus too; in fact so many of the famous brands of cheese get their distinctive flavours from molds.

Most mushrooms are to be seen when the rains set in, though some may even be discovered in the dry season. Often brilliantly-coloured and exhibiting amazing variations in size, the familiar cap-like portion of the mushroom is actually only the reproductive part of the fungal body. Many mushroom species are poisonous, so until you know it isn't, or unless you are accompanied by someone who knows about these plants, you are advised to leave them alone. Unfortunately, there really is no easy way of telling if a mushroom is poisonous or not. But you can handle the ones that are sold as food. Alternatively, if you have confirmed

the identity of a wild one, you can examine it and take a closer look at its structure. Mushrooms have to be handled very gently or else you can destroy the entire fruiting body. If you tap the mushroom cap on a piece of white paper, you will see minute flecks on the paper. These are spores and there are countless such spores in a single cap. These spores bring about the reproduction of the fungus. Under natural conditions, hundreds of thousands of them are shot out (released) from the main plant. Raindrops and wind help scatter the spores that are subsequently carried over long distances. This should explain why these little magical plants are so widely distributed on this planet's land area.

Examine the fungus downwards, where the plant's vital structures lie. The umbrella-like cap works as a shelter. On its underside are the gills that produce the spores. The cap protects the spores from rain and this facilitates the carrying of dry spores by the wind. Now look at the stalk, which functions as the stem of plants. The stem connects the cap to the web of filaments below. The thread-like filaments are called hyphae – the underground part that carries out the functions of roots and leaves. The hyphae form a network in the soil. This network is called a mycelium, which spreads through the soil absorbing water and nutrition. You may sometimes have seen mushrooms growing in a ring. Long ago it was believed that mushrooms grew in a circle where fairies danced at night! The truth is that a ring of mushrooms marks the edges of the hyphal network, underground. It is these hyphae that do the real hard work of decomposition, of breaking down organic matter. Occasionally you may see mushrooms growing at the base of large trees. If you dig around them slightly, you will see that certain mycelia form a joint network with the tree's root hair. This makes it possible for the mushroom to tap that tree for its nutrients. One would assume that this harms the tree. But it has been found that some trees grow poorly if the mushrooms are not present! ■

New year, new challenges

The Indian new year began on a somber note with the attack on the Pathankot Airbase, but political parties have to rally around and ensure that governance doesn't get stalled.



C. V. Aravind

is a Bangalore-based freelance journalist.

THE New Year has begun on a sour note with the attack on the Pathankot Airbase in Punjab by suspected terrorists on a mission to destroy our strategic assets. While the attackers were neutralised after an intense combing operation, we also lost six of our men and once again it has become evident that our neighbour Pakistan has not been able to rein in terrorists operating from safe havens in that country. India's response this time around has been direct and all the necessary proof has been handed over to Pakistan for immediate action at their end as the handlers in this operation as in the Mumbai attacks, were all ensconced on Pakistani soil. With the US also coming out strongly against the attacks and with the US Secretary of State John Kerry calling on Pakistani Prime Minister (PM) Nawaz Sharif to investigate and bring the culprits to book, Pakistan is now on tenterhooks as it can only play ducks and drakes with India and not with a superpower like the US on which it is dependant both for financial and military assistance. While there is hope that Pakistan will finally see reason, it is now imperative for us to beef up our intelligence network and safeguard our borders by thwarting all efforts to create tension.

Meanwhile, the 'intolerance' debate rages on and the Central government and all those on the other side including writers, playwrights, rationalists and the opposition are still not on the same page. The government has been sticking to its stand that intolerance is a non-issue and is nothing more than a bogey created by those who are inimical to the ruling party. The stubbornness only seems to indicate that all those leaders in the ruling coalition who have been raising controversial issues and creating unwarranted tension among communities will continue to be given a free run. Issues like the construction of the Ram Mandir are highly sensitive and have the capacity to drive a wedge between communities. The obligation is squarely on the government

to dispel all doubts in the minds of those who belong to the minority communities that their interests will be jeopardised in any manner. Towards this end it should pull up all its leaders who seek to queer the pitch with their vituperative statements that could rouse passions and foment unrest.

The spate of farmers' suicides due to impoverishment caused by successive droughts and crop failures is a depressing scenario in several states across the country, and though the onus to provide succour is on the respective states, the Central government too should do its mite to ameliorate the suffering of agriculturists whose interests should be safeguarded at all costs.

The unseemly scenes in both the houses of Parliament and the number of hours lost due to the din has again resulted in a delay in passing vital bills that could have a far reaching impact on the economy. Derailing the development agenda of the government is not going to benefit anyone, and it is high time the opposition which seems hell-bent on creating chaos and mayhem in the houses realises that disruptions only create more problems, and solutions can only be found through healthy debates. The treasury benches too should ensure that their ranks do not create controversies or rake up matters that could lead to frayed tempers and consequent friction in Parliament. It is unfortunate that despite the existence of a vigilant media that unfailingly highlights the unruly behavior of members, there has been no perceptible improvement, and the recent monsoon session at the Upper House where the ruling coalition is in a minority and transacted very little business, is a case in point.

Every nation faces challenges and India is no exception. What is vital is that we should unitedly fight these challenges and overcome the problems in the true nationalist spirit. ■



ART BEAT

YOUNG

Showcasing culture

FEBRUARY, Surajkund, a rustic village bordering Haryana and Delhi, presents a colourful kaleidoscope of the finest Indian handicrafts and handlooms. The 15-day long crafts mela, one of the largest of its kind in the country, attracts top craftsmen from all over India and abroad.

The festival was started in 1987 by the government to promote Indian culture. Today it has gained international stature with a number of foreign tourists including it in their itinerary. The fair is set up around Surajkund, an ancient lake literally meaning 'Lake of the Sun'.

The sprawling grounds turn colourful with a number of makeshift stalls displaying exquisite artifacts and handlooms. They include silk and cotton textiles, mirror work, pottery, stone work, terracotta, papier-mache, cane, lacquer, metal and glass work. Adding to the splendour are Pashmina shawls from Ladakh, metalware

from Sikkim, lacquerware from Gujarat, puppets from Rajasthan, embroidered umbrellas from Orissa and intricately carved woodwork from Punjab.

At some stalls visitors can also see skilled craftsmen in action — either weaving a fine saree or a cane bag. Enthusiastic visitors may try their hand at shaping a clay pot or two! The *mela* hosts cultural programmes and theatre workshops.

Folk dances, dramas and music programmes are held in a fanshaped open-air theatre called

Natyashala. The *mela* has its share of tight-rope walkers, rummers, jugglers, stiltwalkers, clowns, magicians and *mehendi* artists. Food courts that offer authentic fare from across India are a big draw.

Besides SAARC countries, some European and African countries also participate in this prestigious *mela*.



SPARKLER

A King's generosity

ONE day a woman threw a stone at Maharaja Ranjit Singh and was promptly arrested and brought before the ruler.

"Why did you throw a stone at me?" asked Ranjit Singh. "T...The stone was not meant for you, Maharaj," said the woman, trembling uncontrollably. "My children are hungry since yesterday morning and I was trying to knock down some fruit from the *ber* tree."

The king looked at her sunken eyes and her thin, wasted body, and was moved to pity. He turned to one of his ministers and asked him to give the woman a thousand rupees.



"She should be punished, Your Majesty," said the minister.

"Why are you rewarding her?"

"Because I think the King of the Punjab should be more generous than a *ber* tree when a stone is thrown at him," said Ranjit Singh, smiling.

PUZZLE Work it out

A shopkeeper sells chocolates with golden wrappers for a rupee each. When Abbas goes to the shop, the shopkeeper tells him that he can exchange three wrappers for a chocolate. Abbas has ₹15 in his wallet.

How many chocolates is he able to get?



Answer : 22 chocolates. He buys 15 chocolates with his money and exchanges their wrappers for 5 chocolates. He has 3 wrappers now and gets one chocolate in exchange. He removes its wrapper and gives it along with the remaining two chocolate wrappers he has with him to get one more chocolate.

Wise Old Man of the Hills



WANG SUN was a fabulously wealthy merchant. But he wasn't born with a silver spoon in his mouth. For years he struggled, battling poverty and creditors, dealing with clients and suppliers and bankers and skeptics.

He became rich, slowly and steadily. He now had a magnificent home, carriages, and wore garments and jewellery fit for a king. One day, he heard that all his ships were lost at sea. Wang Sun had raised a lot of money from moneylenders and banks to outfit his ships for trade, and overnight, he lost everything to his creditors.

His home, his carriages, his magnificent garments and jewellery, his servants and assistants, all disappeared as mist before the sunlight.

Wang Sun was now a broken man. "What shall I do," he wailed, "I have lost everything. I cannot go on anymore. Let me kill myself."

His wife, who was a very determined woman, said, "You shall do nothing of the sort. We will visit the wise old sage who lives amongst the hills. People say he understands the ways of nature and the ways of man very well.

Let us ask him for advice and see what he says."

"Is he a money lender? Is he a merchant?" said Wang Sun as he followed his wife up the hill. "How can he help me?"

When the Wise Man of the Hills heard Wang Sun's story, he laughed loud and long. Then he said, "Watch." He took a handful of sand and threw it over an ant crawling at his feet.

The ant, after a brief struggle, came up out of the sand and again started about his business. The Wise Man again threw a heap of sand on the ant. The

ant again struggled for a long time, then finally poked its head out of the heap of sand.

"No matter how many times I throw sand over this little fellow, he will struggle out of the heap and go about his business of collecting food. That is his nature. What is your nature, Wang Sun, my boy?"

You have struggled to reach a position of great wealth and power, but you let only one heap of sand defeat you? The ant does not understand adversity and defeat, no matter how many times it comes to him. He does what nature meant him to do.

Are you a merchant by nature, Wang Sun?

Then go, follow your nature and don't come crying to me with little things."

Wang Sun went back to the city with renewed hope. In time, he became rich again for he had discovered his nature.

He never forgot the Wise Old Man of the Hills, whose name was Confucius.



AMAZING LIVING WORLD



THE African Grey Parrot is one of the smartest birds in the world. It is almost human in its ability to mimic sounds, talk and identify colours. It is even reputed to be able to count. One famous parrot called N'kisi reportedly had a vocabulary of 1200 words and could talk in sentences! Another, Alex, could relate words to objects.

As the name implies, it is predominantly grey in colour with patches of white and a red or maroon tail.

Not a bird brain

African Greys were popular pets even 4000 years ago. Unlike other birds they are expensive to maintain and require a great deal of personal attention. Talking to the bird, giving it new and interesting toys to play with and even letting it out for a few hours - are essential to its survival.

Laboratory studies show that if properly trained, they can have vocabularies of over 1000 words and can even comprehend the concept of zero.

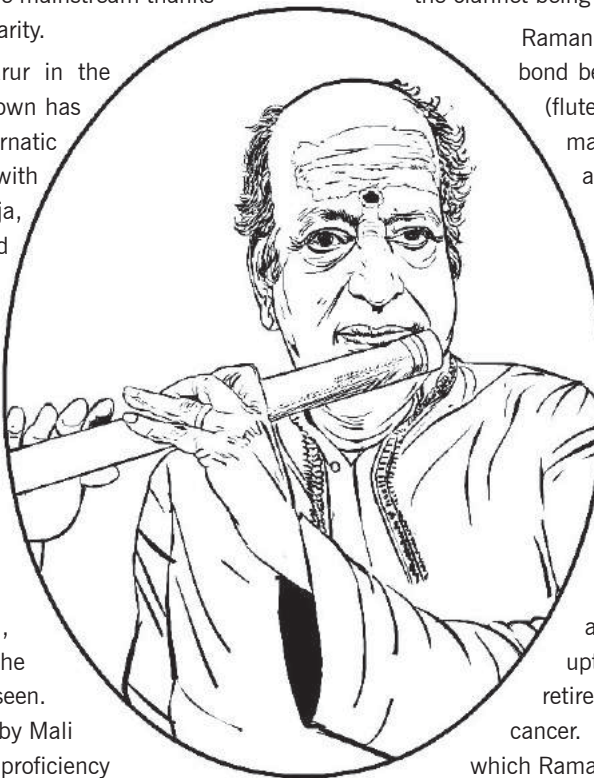
DR. NATESAN RAMANI

A peerless artiste (1934-2015)

EMINENT flautist N. Ramani who passed away recently in Chennai at the age of 81, was one of the most popular classical musicians in the country, who along with his illustrious maternal uncle T. R. Mahalingam (Mali), is credited with bringing international recognition to the humble instrument, the 'flute', taking Indian classical music to the far corners of the world. In fact, the uncle-nephew duo was instrumental in elevating the flute, for long considered an accompanying instrument, into the mainstream thanks to their wizardry and rising popularity.

Ramani was born in Tiruvarur in the year 1934. Tiruvarur, a temple town has always had a unique place in Carnatic music as it was associated with the musical trinity: Thyagaraja, Muthuswamy Dikshitar and Shyama Shastri. Ramani was a child prodigy born in a musically inclined family, and took his first lessons in playing the flute from his grandfather Aazhiyur Narayanaswamy Iyer when he was just five years old. He gave his first solo concert at the age of eight, and at the age of eleven he was deemed good enough to accompany the great Mali, arguably the greatest flautist the world of classical music has ever seen. The good grounding given to him by Mali was instrumental in his gaining proficiency in the instrument and in going on to become one of the finest exponents of the art.

Both Mali and Ramani had distinctive styles and Ramani later invented the long flute and used it for the first time in classical music concerts. In this he was inspired by the famous Hindustani flautist Pannalal Ghosh who used long bass flutes in his concerts. Ramani also developed his own inimitable style of playing the flute and trained his pupils in the art at his academy named the 'Ramani Academy of Flute' which had branches in many other countries as well. The Academy attracted students from all over the world. Ramani too was widely travelled and went on concert tours to several countries including the US, Canada, Switzerland, France and Sri Lanka.



The flautist also won acclaim for his participation in jugalbandhi with other famous musicians and his concerts with legends in Hindustani classical music like flautist Hariprasad Chaurasia and also with the likes of M.S. Gopalakrishnan, N.Rajam and the mandolin whiz, the late U.Srinivas. He also earned distinction by accompanying clarinet *vidwan* A.K.C. Natarajan and so pronounced was his artistry and his mastery over his craft, that his notes rung out loud and clear despite the clarinet being a dominating instrument.

Ramani was also instrumental in forging a bond between the veena, violin and venu (flute), and his concerts with veena maestro Trivandrum Venkataraman and the renowned violinist Lalgudi Jayaraman always charmed classical music aficionados. Ramani also combined well with several other luminaries in the field like T.N. Krishnan, Palghat Mani Iyer, Umayalpuram Sivaraman and Karaikudi Mani, among others. Ramani won renown for his tonal purity and blowing quality, and his pristine handling of the instrument. Ramani remained active on the music circuit right upto his seventies and was forced to retire after he was afflicted with throat cancer. The annual concert at Tiruvarur which Ramani inevitably attended along with a galaxy of musicians representing various disciplines in classical music, will certainly miss his august presence.

A number of honours came the way of this unassuming musical genius, and apart from the Padma Shri awarded by the Government of India, Ramani also won prestigious awards like the Sangeetha Kalanidhi, Kalaimamani, Isai Peraringar and the Sangeetha Kalasikhamani. Deeply religious and humble to a fault, Ramani never claimed to be in the same league as his uncle Mali, though his admirers would aver that he was no less talented. His son Thyagarajan and grandson Atul Kumar who have taken after him, later accompanied him in his concerts. As the inheritors of his rich legacy, the onus is now on them to carry the baton onward. ■

– C. V. Aravind is a Bangalore-based freelance journalist.

BAPPADITYA BANDOPADHYAY

Brilliant and eclectic filmmaker (1970-2015)

BAPPADITYA Bandopadhyay, a contemporary filmmaker within Bengali cinema, whose fame spread wider beyond Indian shores than within, passed away in a private nursing home in Kolkata on 7 November 2015, of multiple organ failure. He was only 45. He contracted pneumonia while shooting continuously for 19 days in the rains at Cherapunji for his new film, *Sohra Bridge*. Ironically, the film was screened in the Indian Panorama section of the International Film Festival of India.

Bappaditya was noted for his choice of strikingly unusual subjects for his films. Among these are *Sampradaan*, a film made for a satellite channel. Then followed *Shilpantar*, based on a scary story by Sirsendu Mukhopadhyay, few directors would dare to touch. *Kantataar* and *Kaal*, focussed on varied dimensions of the woman in contemporary India. While *Kantataar* (*Barbed Wire*) dealt with the identity crisis of a homeless young woman who is caught in the midst of border terrorism along the India-Bangladesh border in India, *Kaal* was on the trafficking of young girls from villages, establishing Bappaditya firmly in the international circuit, though the films did not do well commercially back home. He made *Devi* in Hindi and English with Perizaad Zorabian and Suman Ranganathan that demonstrated how two very different women from two disparate backgrounds, one rural and one urban, were victims of patriarchy, never mind the surface differences in their lifestyles and their class. He followed up with *Housefull*, *Kagojer Bou*, *Elar Char Adhyay*, which was adapted from Rabindranath Tagore's novel, and *Nayika Sangbad* which, sadly, was a washout. This was the last film released during his lifetime. "My first film *Sampradaan* was based on Ramapada Chowdhury's novel. *Shilpantar* was based on Sirshendu Mukhopadhyay's short story 'Patua Nibaran'. *Kantatar* was based on Debasish Bandyopadhyay's novel. Only *Housefull* and *Kaal* were based on my own stories", he had said.

Houseful was a partly autobiographical account of a film director who makes off-beat films that fail to draw an audience, and the director watches the film in empty theatres. The

one quality that distinguishes Bappaditya Bandopadhyay's *Houseful* is that it has strong autobiographical elements. Prosenjit's look is fashioned after Bappaditya who wears a beard. Each time Nikhil's mobile rings, it is Bappaditya's cell-phone ring tone that belts out Gautam Chatterjee's famous *Mohimer Ghodaguli* number.

Bappaditya's style was characterised by the use of the surreal in his characterisations, in his shot structures and incidents. Though this creates some confusion in the beginning, one gets used to the language with time.

Sirsendu Mukhopadhyay's stories are perhaps the most challenging to place on celluloid.

This becomes more challenging when the filmmaker has to create the time-leap from the original story written around 30 years ago to bring it to contemporary times where the core ideology or, rather, the lack of it, is represented by the protagonist Upal in 2010. Bappaditya makes the time-leap convincing without taking liberties with the core in the original. Few know that he was also a poet of repute. His published work of poetry includes *Pokader Atmiaswajan* (*Friends and Relatives of Insects*) and his poetic sensibility was reflected in his films.

His brief career was generously dotted with awards aplenty. *Sampradan* won the Best Supporting Actress Award, the Best Supporting Actor Award and the Best Female Playback Singer award at the Bengal Film Journalists Association that year, and

the Dishari Award for the Best Music. Debasree Roy won the Kalakar Award for Best Actress for her performance in *Shilpantar*. *Kantataar* was screened at around 17 film festivals across India and beyond. It bagged for Sreelekha Mitra two Best Actress Awards, and one Best Supporting Actor Award for Rudraneel Ghosh. Bappaditya also directed a television serial, *Ananda Nagarir Kathakatha*, on the architectural history of Kolkata for a popular Bengali television channel. His documentary on tribal masks was broadcast on Doordarshan. He was planning to make a lengthy documentary on renowned painter Hemendra Majumdar. ■

– Shoma A. Chatterji is a freelance journalist, film scholar and author, who has won the National Award for Best Writing on Cinema.



CAPTAIN GURJINDER SINGH SURI, MVC

Exemplary patriotism (1974-1999)

CAPTAIN Gurjinder Suri was born on 4 July 1974. His grandfather, a Second World War veteran, had retired as Subedar and his father Colonel T.P. Singh had also chosen a career in the army. Gurjinder decided to follow the family tradition and was commissioned into the Ordnance Corps. All officers commissioned into the Ordnance Corps have to serve with an infantry battalion for a year and Gurjinder was attached to 12 Bihar which was then deployed in Kashmir, and Gurjinder was assigned to command Faulad post in Gulmarg sector. After the defeat in Kargil conflict, the Pakistan Army had started using mercenaries to launch suicide attacks and had intensified artillery attacks in the 60 km stretch from Yusmarg to Tangdhar. The militants and soldiers would try to infiltrate under cover of artillery fire. Faulad post at a height of 11200 feet provided a commanding position in the Gulmarg Sector. Pakistan Army's plan was not merely to capture Indian Army post, but to also carve a passage for infiltration into Gulmarg region, which would allow them to reach Pattan and Baramula.

The Pakistan Army launched an attack on the Faulad post on 9 November 1999. The attack was preceded by a heavy artillery bombardment. One of the shells fell close to the ropeway station but no major damage occurred. It was perhaps not a deliberate attack on the ropeway system. The Pakistan attack was repulsed. Gurjinder deployed his men to deal with any reinforcements or interference by the enemy. He started to clear the enemy bunkers one by one. One of his soldiers was hit badly. He dashed forward to kill two enemies with his AK 47 rifle and silence the machine gun. He received a burst of gunfire in his arm. Unmindful of his injury, he continued to lead his men and lobbed two hand-grenades into a bunker. He then entered the bunker spraying bullets, and killed one enemy soldier. At this point, he was hit by an enemy rocket-propelled grenade and was critically wounded. He declined to be evacuated and continued to exhort his men till he breathed

his last. Captain Suri displayed extraordinary leadership, inspired by which his men fell upon the enemy with vengeance and annihilated them. He displayed extraordinary courage and outstanding leadership in the face of the enemy and made the supreme sacrifice in the highest traditions of the Indian Army. He was awarded MVC in recognition of the gallantry. He had achieved a first in that it was the first MVC awarded to the Ordnance Corps. Captain Suri and three soldiers had sacrificed their lives. Seventeen enemy soldiers were

killed and fourteen bunkers destroyed. It is a difficult terrain and it took four days to bring back Gurjinder's body. In this operation which lasted about an hour and a half, one MVC, one VrC and two SMs were awarded. A soldier from 12 Bihar came to the residence of Colonel T.P. Singh to hand over the belongings of Gurjinder. Colonel Singh burst into tears on seeing the belongings. The soldier said to him, "You have lost a son, but the unit has lost a father figure."

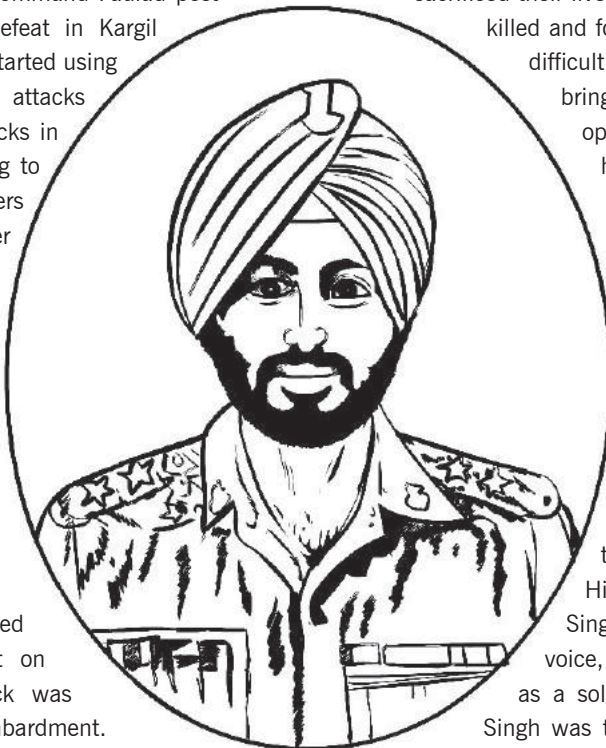
Tributes were paid to him on the anniversary of his sacrifice. His grandfather Subedar Gurbaksh Singh said in an emotion choked voice, "Gurjinder has performed his duty as a soldier to his motherland." Colonel Singh was the solitary recipient of the MVC on Independence Day in 2001. The medal was

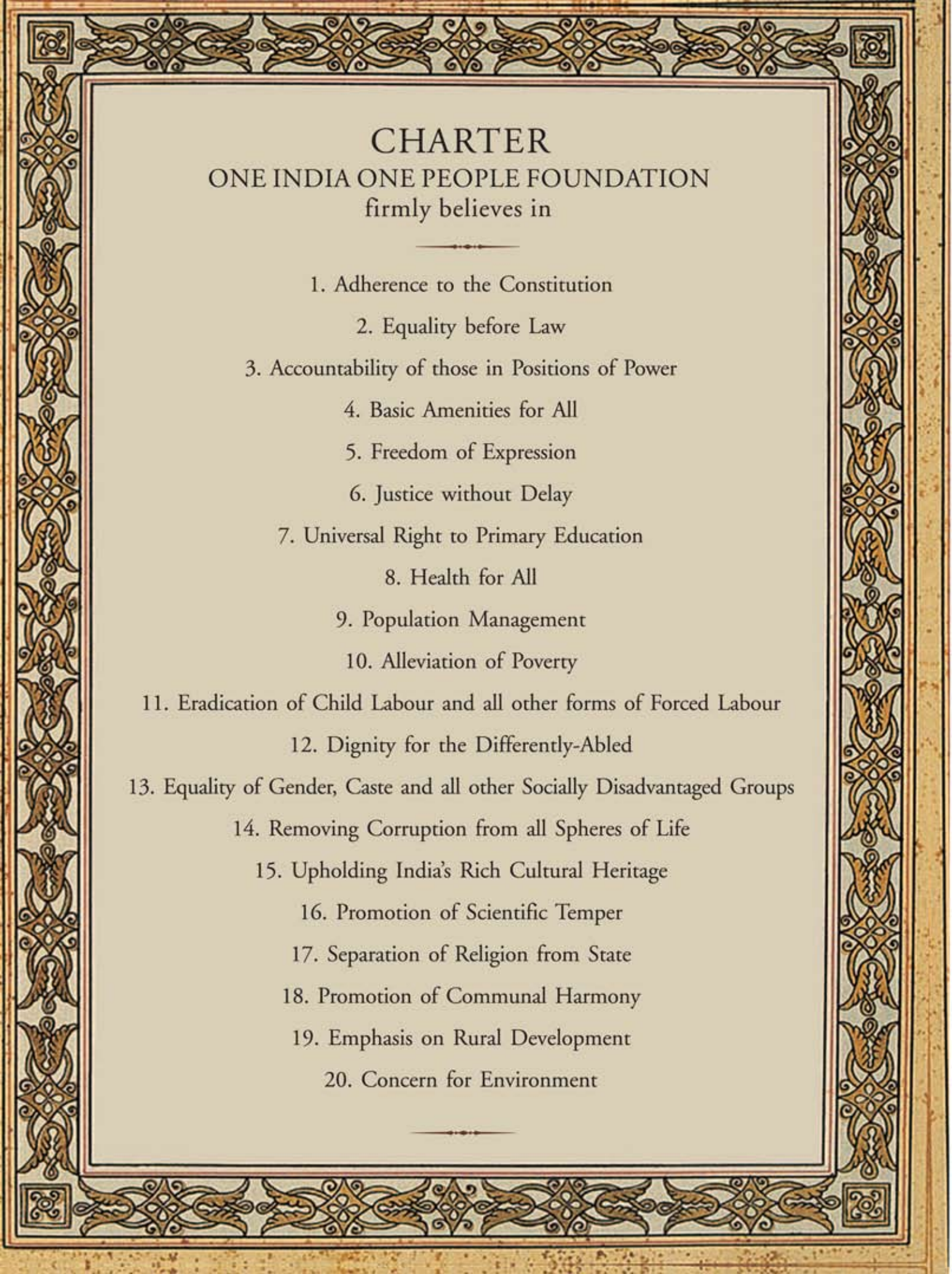
stolen from his residence in Mohali, Chandigarh, in 2006, much to the distress of the family. Squadron Leader T.P.S. Chinna (Retired) came across this medal in an antique shop in Delhi. It had the number and name of Captain Suri on it. He obtained the details of the family from the Army HQ and sent it to Colonel Singh. The joy of the family knew no bounds on receiving it on Independence Day in 2012.

Colonel Singh said, "Honour has been restored. I am the happiest person in the world as the most precious thing of my life, my son's medal is back with me". ■

— Brigadier Suresh Chandra Sharma (retd)

(Sketches of Great Indians by C.D. Rane)





CHARTER

ONE INDIA ONE PEOPLE FOUNDATION

firmly believes in

1. Adherence to the Constitution
 2. Equality before Law
 3. Accountability of those in Positions of Power
 4. Basic Amenities for All
 5. Freedom of Expression
 6. Justice without Delay
 7. Universal Right to Primary Education
 8. Health for All
 9. Population Management
 10. Alleviation of Poverty
 11. Eradication of Child Labour and all other forms of Forced Labour
 12. Dignity for the Differently-Abled
 13. Equality of Gender, Caste and all other Socially Disadvantaged Groups
 14. Removing Corruption from all Spheres of Life
 15. Upholding India's Rich Cultural Heritage
 16. Promotion of Scientific Temper
 17. Separation of Religion from State
 18. Promotion of Communal Harmony
 19. Emphasis on Rural Development
 20. Concern for Environment
-

WHO AM I?

- Am I a Hindu first or an Indian first?*
Am I a Muslim first or an Indian first?
Am I a Christian first or an Indian first?
Am I a Buddhist first or an Indian first?
Am I a Brahmin first or an Indian first?
Am I a Dalit first or an Indian first?
Am I a South Indian first or an Indian first?
Am I a North Indian first or an Indian first?
Am I the President of India first or an Indian first?
Am I the Prime Minister of India first or an Indian first?
Am I the Commander-in-Chief first or an Indian first?
Am I a supporter of any 'ism' first or an Indian first?
Am I a white-collar/blue collar worker first or an Indian first?
Am I a youth/senior citizen first or an Indian first?

*In all cases you are Indian First, Last and Always.
Be a Proud Indian. Make this country Great, Strong and United.*



Sadanand A. Shetty, Founder Editor

(October 9th, 1930 – February 23rd, 2007)

ONE INDIA ONE PEOPLE