People in Conservation

Biodiversity Conservation and Livelihood Security

KALPAVRIKSH
कल्पवृक्ष
Environmental Action Group

Volume 5 Issue 2 April 2013 - Oct. 2013

Index

Special Issue on BRAI 2013 bill and Agrobiodiversity

Editorial

In early September 2013 the National Food Security Bill (NFSB) was passed by a voice vote in both the houses of the Indian Parliament and it became the National Food Security Act (NFSA). This is good news. Over 300 amendments were made to the bill, most of them to expand its scope through an universalized public distribution system (PDS), covering pulses, oil and salt, in addition to staple grains, and also to introduce schemes like a community kitchen for the destitute. Not surprisingly the act has been savaged by many economic "experts" on the roll of the mainstream media – the trope of unaffordability of implementation of the act being common to all. Some have propagated fears that this bill can actually harm the economy and it will mean a lot of "money down the drain" because of the high levels of leakage and wastage in Public Distribution System (PDS). The validity of such "concerns" have been questioned[1] – the issue of affordability - seems to be due to errors in calculations and the absurd assumptions on which they are based; Whether the potential economic loss is merely a question of addressing existing lacunas through institutional reforms (as has been successfully carried out in some states) is yet to be seen. With general elections around the corner, the opportunism is obvious, but there is no consensus on whether that is bad in itself.

Nagarjuna, one of the great Buddhist philosophers, advised a Satvahana king to "provide stricken farmers with Seeds and Sustenance". Nagarjuna also advises the king to eliminate robbers and thieves, to ensure fair prices and to keep profits at a reasonable level even during times of scarcity. In September- inflation, as indicated by the wholesale price index, rose to a seven-month high of 6.46 per cent. Food inflation was at 18.40 per cent, led by spiraling onion prices, which skyrocketed to a whopping 323 per cent. Cartelization[2], hoarding and price manipulation have become common practices in the onion trade. What else is cartelization but a form of robbery – a bleeding process with vengeance? Yet the Union Minister for Agriculture Shri Sharad Pawar ascribes the phenomenon to nothing more than a seasonal shortage. Incidentally, Pawar's party, the NCP, holds sway in Nashik, which handles 70 per cent of India's onion trade.

Clearly Sharad Pawar is not interested in addressing the real issues besetting India's agricultural sector. For more than a decade India has been suffering from an agrarian crisis, and, indebtedness and suicide are its most brutal, though by no means only, expressions. However, the union minister would rather distract us by speaking about the necessity of genetically modified (GM) crops for feeding India's masses, while dismissing the widespread concerns about them. His whole-hearted endorsement of GMO, taken together with his contempt for social measures like the Food Rights Act (as articulated in his recent diatribe against the National Advisory Council (NAC) in the wake of the congres's defeat in the recent assembly elections in four states) foretells troublesome times ahead, both for the farmer producer and for the beneficiary of welfare measures.

Concerns with regard to GMOs have been raised in a 2012 report by the Parliamentary Standing Committee for Agriculture (PSCA) consisting of 31 members coming from across party lines and more recently in a report by the Technical Expert Committee (TEC) appointed by the Supreme Court in a case of Public Interest Litigation (PIL) on GM[3]. Not surprisingly the Agriculture Minister and the Environment Minister have decided to file a joint affidavit in the Suprem Court asking that field trials of GM crops be allowed. Way back in 1962, Rachel Carson wrote in her seminal book ***Silent Spring****, "If we are going to live so intimately with these chemicals - eating and drinking them, taking them to the very marrow of our bones – we had better know something about their nature and their power." Over 50 years since, we know that these concerns cover health, environmental risks, farmers' indebtedness, the stranglehold of large transnational seed corporations, loss of seed diversity and food sovereignty. Despite this, the Biotechnology Regulatory Authority of India (BRAI) Bill was recently tabled in Parliament. It is meant to speed up the approval for GM crops stalled by these Committees' findings. But legality does not imply moral legitimacy. A fact often overlooked is that at the world level, only six countries account for over 90% of all the area under cultivation of GM crops. Most countries are rejecting or restricting them. If going GM was a panacea then why have incidences of farmers' indebtedness and suicides not decreased despite wide adoption of Bt cotton? Promoting GM crops in the name of food security[4] and poverty is equally baseless. This is not an issue of production but that of distribution. India has produced bumper crops of food grains, all without GM; yet 200 million people go hungry while grain rots in badly managed government warehouses. This is a question of an inefficient and corrupt Public Distribution System (PDS). However this does not automatically imply that the PDS needs to be scrapped. The invisible hand of the market will not automatically increase the buying capacity of the poor. The value and importance of the PDS in providing support and social protection in rural areas, in states (like Tamilnadu and*

1. For one such rebuttal, see Cost of Implementing the National Food Security Act, Dipa Sinha, Economic & Political Weekly, September 28, 2013, VOL XLVIII NO 39.
2. See Ring Masters, Saumik Dey, http://week.manoramaonline.com/cgi-bin/mmonline.dll/portal/ep/theWeekContent.do?contentId=15165815&programId=1073755753&tabId=13&BV_ID=@@@&categoryId=-208261
3. Also see GM crops- Part I: The truth about genetically modified foods, Dilnavaz Variava.
4. See GM crops- Part II: The myth about food security, Dilnavaz Variava.

Chhattisgarh) where PDS reforms have been implemented, has been convincingly argued[5] by many. More to the point, considering it will further consolidate vested power-and-profit in the grip of a few multi-national corporations like Monsanto, will not nature-transforming technologies have any distributional and social consequences? We should stop working at cross purposes (e.g. BRAI) that could threaten our food sovereignty and start working towards what is actually the need of the hour –an efficient PDS, and policies that foster non-GM agricultural practices. Even if it was an issue of production (which it is certainly not!), why not go for safer alternatives like Agro-ecology – a practice that is gaining in prestige across the world, given that it promises inclusiveness, participatory approach, livelihood generation, stemming of migration to cities, empowerment of the small farmer, and stimulation of family farming practices. Even the UN endorses it.

The present ruling dispensation may have taken an arguably positive step in promulgating the Food Rights Act but its stand against stiff pressure from other developing countries at WTO[6] in Bali over its decision to provide subsidy (on staple food crops without any threat of punitive action) was nothing but succumbing to US pressure. This needs to be condemned. Its moral high ground notwithstanding, India should have argued on the basis of welfare and human rights – that "its appalling figures of hunger and malnutrition amount to gross violation of people's right to food and any attempt by the government cannot be placed under the perview of WTO sanction". As one observer aptly commented "After Bali we should expect an influx of heavily subsidised agri produce from outside. This will knock the stuffing out of Indian farmers already reeling under adverse domestic policies."[7]

Let us not forget that food is not simply a commodity (even if the market would have us believe so!). Food is a throbbing and dynamic expression of history, culture and civilization. It represents a way of life; nay it is life itself. Let us not reduce it to an abstraction – a plaything subject to the whims of market and technology. Let us not forget that hunger, as a felt experience, is not an issue of charity but that of justice. Food is an inalienable, fundamental and a sacred right. Those who produce it for us deserve our greatest reverence.

Milind

5. Rural Poverty and the Public Distribution System, Economic and Political Weekly, November 2013, Jean Dreze, Reetika Khera.
6. Seehttp://ibnlive.in.com/news/india-has-its-way-at-wto-demand-for-no-cap-on-food-subsidy-accepted/438158-2.html
7. See How India sold out to the WTO, Suman Sahai (Gene Campaign), The Aisan Age, http://www.asianage.com/columnists/how-india-sold-out-wto-888

Reflections - Past, Present and Future

Agrobiodiversity: Past and Present[8]

Kathleen D. Morrison (email: morrison@uchicago.edu)

The Protection of Plant Varieties and Farmers' Rights Authority, a division of the Government of India's Ministry of Agriculture, includes in its brief the protection of agrobiodiversity, the dimension of biodiversity that consists of cultivated plants and domesticated animals. Insofar as agrobiodiversity plays a critical role in reducing risk and enhancing the quality of both diets and environments, the existence of such an authority must be seen as positive. Nevertheless, their listing of "agrobiodiversity hotspots," which encompasses a significant portion of the Indian landmass, explicitly links hotspot districts to "tribal populations," clearly suggesting that highly diverse assemblages of cultigens are themselves something outside of mainstream agrarian practice; indeed, perhaps something ancient or primitive. While agriculturalists in the past certainly maintained impressively high levels of agrobiodiversity, such practices are as critical to the future as they have been to the past. Far from representing some sort of outdated mode of farming, the modern field of agroecology recognizes the critical importance of cultigen diversity as well as other practices such as intercropping, fallowing, and integrated pest management. Indeed, many of the newest forms of farming such as organic farming and biodynamic agriculture are built, in part, on observations of Indian agriculturalists. Sir Albert Howard, widely seen as one of the fathers of organic farming, based much of his influential 1940 work, *An Agricultural Testament*, on his observations of farming in western India. His "Indore process" involved creating soil amendments from manure, a practice he documented during his imperial service. Organic farming, thus, owes a real debt to Indian farming traditions.

In my research on the history of agriculture and of human engagement with the natural environment in southern India, I have been quite concerned to try and understand both how and why farming strategies changed through time. From the Southern Neolithic, five thousand years ago, to the present, residents of the semi-arid interior districts of northern Karnataka have practiced a diversity of agricultural strategies, many designed to cope with the high risks of farming in a region with extremely low and variable rainfall. While permanent irrigation in the form of river-fed canals created by ingenious *anicuts*,

8. See for more: http://www.plantauthority.gov.in/hotspots.htm, accessed 22 Nov. 2013.

or long, low dams, dates in this region only to about the tenth century, farmers have harvested runoff and built a wide range of soil and water control devices from the very beginnings of agriculture. Checks-dams and erosion control walls were joined during the Iron Age (1200-300 BCE) by small runoff-fed reservoirs which served not only as stock tanks, but also as ponds for supplemental watering of small quantities of moisture-loving crops such as bananas, wheat, and barley. While these hand-watered crops were clearly 'boutique' products, residents of the newly-emergent towns of Iron Age northern Karnataka also relied on wild plants and animals to a significant degree, supplementing their main diet of a large variety of millets and pulses. While we cannot say if the latter were grown in intercropped fields, it seems likely given the well-known benefits of such strategies – pest resistance, Nitrogen fixation, temporal and spatial complementarities, and of course, higher yields.

By the Middle period (1200-1700 CE), when canal irrigation was developed to water wet rice and a range of high-value crops, thousands of runoff-fed reservoirs or tanks crowded into nearly every possible location outside the reach of canals. These reservoirs, along with smaller features such as terraces and gravel-mulched fields, were used to mitigate the production risks associated with dry farming on the *maidan*. Our archaeological work around the city of Vijayanagara, capital of the eponymous empire, shows that the fertility of dry-farmed fields near villages was maintained by manuring. Small-scale, manually watered production of moisture-intensive crops was by this time limited to high-value garden crops such as vegetable, fruits, and flowers, while rice was grown on a large scale wherever sufficient water was available. At the same time, large areas were given over to grazing, with both village animals and the flocks of mobile pastoralists using the landscape. By the sixteenth century, then, we see a highly diversified agricultural landscape, with wet fields, intensively-worked gardens, dry fields, and grazing lands, all integrated into a complex political ecology. While this situation was predicated on significant social inequality and even exploitation, some forms of production proved to be highly resilient, with certain fields under more or less continuous cultivation for over 600 years.

Although we know a great deal about regional-scale agrarian landscapes from the Neolithic to the present, our work on the physical remains of cultivated plants – the charred seeds, stems, and other plant fragments that preserve in archaeological sites – is just beginning. We are hoping to be able to say more than simply which species were grown in the past. If possible, we hope to document something of the agrobiodiversity of past farming, identifying something of the range of forms even within a single taxon. This is a slow process, but we are beginning with rice, thanks to the assistance of the GREEN Foundation, Bangalore. Using more than a hundred traditional rice varieties preserved by the foundation, we are working through morphological and isotopic characterization of these modern varieties in order to help us learn to analyze past diversity. We already know for thousands of years local farmers have been growing a large number of millet species – some locally domesticated and some coming from as far away as Africa – but we also suspect the existence of significant varietal variability even within a single species. Pulses, too, show high diversity. Different varieties may be suited for specific soils, may be planted strategically based on current weather, and of course also have different flavor profiles that are valued for specific dishes, seasons, or festivals. If we are successful, we will learn a great deal more about past farming practices, but of course the very existence of significant present-day agrobiodiversity should alert us to the ongoing significance of cultigen variability. We deal with the past, but our colleagues in the GREEN Foundation work in the present, with its rich, if threatened, diversity and it is their work which may allow us to learn more about the past.

Agrobiodiversity, which includes varietal diversity as well as the existence of a range of cropping strategies, is by no means only a feature of history, nor is it something outside mainstream farming. The long-term success of agriculture, even in hostile environments, is a testament to the knowledge and experience of South Asian farmers, something Howard and others recognized. India's agrobiodiversity "hotspots" owe their existence to generations of innovative farmers from many communities who have developed such a wide range of species, varieties, breeds, and cropping strategies. Let us celebrate and preserve this heritage, not only for its own sake, but for ours as well.

Note: The author is Director, South Asia Language and Area Center, Neukom Family Professor at Anthropology and the College, Director, South Asia Language and Area Center, Neukom Family Professor - Anthropology and the College, University of Chicago.

Agrarian Crisis: The irreversible impacts on the rural poor and on natural resources

Kumar Shiralkar (email: kumarshiralkar@hotmail.com)

The agrarian crisis directly affects the toiling masses in rural India whose genuine subsistence and livelihood

needs are mainly satisfied from agriculture and its ancillary occupations. Though these downtrodden sections of society were already suffering from multifaceted miseries that have been historically foisted upon them, the recent crisis triggered by neo-liberal policies has made conditions of life even more unbearable for them. It is well known that since ancient times a significant proportion of the people were prohibited from holding land and from other property rights. Though such rights belong to the mundane earthly relations of production and appropriation, such denial was earlier imposed under the garb of religious overtones and sanctions. At present 'dalits', 'nomadic tribes' and some segments of population referred to as Other Backward Classes (OBC) are still not allowed to own, possess and cultivate land in many places.

Even after Independence, the so-called land reform policies announced by the Central and various state governments, except for a few states like Kerala, West Bengal and Jammu and Kashmir, made no serious attempts to distribute land to the landless and the land-poor.

On the contrary, the appropriation and concentration of land in the hands of large land-holders (land that earlier belonged to middle level and marginal peasants) continued relentlessly as a consequence of the capitalist path of development adopted by successive governments at the Centre as well as at the state level. Since 1991, when the Indian Government pro-actively yielded to the diktats of the World Bank (WB), the International Monetary Fund (IMF) and the World Trade Organization (WTO), the number of small and marginal peasants has increased tremendously due to many reasons. The already-skewed land-owning pattern has tilted against the poor and middle-level peasants, benefitting neo-rich land mafias, capitalist landlords and the corporate class – strengthening land monopoly. About 10 per cent of the population controls over 55 per cent of the cultivable land, while 60 per cent operates only 5 per cent of the same. As per the Agricultural Census 2010-11, small and marginal holdings of less than 2 hectares account for 85 per cent of the total operational holdings and cover 44 per cent of total operated area. The increasing demand for conversion of agricultural land for non-agricultural uses is limiting the area available for cultivation. The average size of operational holdings was 2.82 hectare in 1970-71. It came down to 1.55 ha in 1990-91; then to 1.33 ha in 2000-01 and to 1.16 hectare in 2010-11. This is an inescapable outcome of neo-liberalism.

To grasp the true meaning of the agrarian crisis one has to look into the burning problems and issues of landless agricultural workers, other categories of rural wage workers and poor and middle-level peasants. One such problem is ever-growing local unemployment and forced migration. The rate of employment in the agricultural sector has declined drastically during the neo-liberal regime (i.e. since 1991). Unabated mechanization in agriculture has played havoc with the lives and livelihoods of millions living in rural areas.

A cursory look at the number of machines used in agriculture reflects the devastating picture. The number of tractors used for agricultural purposes, between 1982 and was 4982. This figure rose to 22,600 in 2003, and, by December 2012, it touched 4, 19,270. There are now 16 or more tractors for every 1000 ha of agricultural land! The number of combine harvesters in 1982 was 386. It rose to 4,073 in 2003 and to 10,000 in 2010. And yet, today, 52 per cent of India's work force (22.5 crore) is dependent upon agriculture for its livelihood. The average wage increase in the agricultural sector during 2001-2010 was 9 per cent per annum, while it was 6.3 per cent per annum for industrial workers. But the inflation reflected in the Consumer Price Index for agricultural workers stands at 694 and increased by 12.30 per cent in January 2012; the average per annum increase during 2001-2012 being more than 10.5 per cent.

The arguments relating to the crisis in agriculture are generally focused on the rate of growth of agricultural output, the comparative ratio of the contribution of agricultural production to the GDP, the viability-profitability-sustainability of agricultural enterprise, the ever-increasing cost of inputs, the denial of remunerative prices for agricultural produce, the decontrol of quantitative restrictions on import, the sweeping reduction of import duties on foreign agricultural products, the consistent trend of declining public expenditure and investment in agriculture-irrigation-rural development, the shrinking subsidies in agriculture / for agricultural production, dearth of institutional credit for agriculture and farmers' (sadly) inevitable reliance on private moneylenders, etc. All these arguments do contain a grain of truth though statistical acrobatics may pose counter-arguments by presenting different figures. Let us not get lost in these deliberately misleading exchanges. It would be more worthwhile to focus our attention on the root causes and on the consequences of this crisis on the health of toiling human beings and on the well-being of natural ecosystems.

The so-called economic reform policies and the structural changes launched in the 1990s and pursued by the UPA-II government are challenging the foundation of India's eco-systems. The advocates of finance and capital-driven

free-market fundamentalism and 'ever-Green Revolution' (after the 1960s, when the first 'Green Revolution' took effect) never tire of admiring the ever-growing use of untested GM seeds, chemical fertilizers and pesticides. Many of those who oppose these policies refer to the high prices of these input commodities, diminishing subsidies and to consequently non-viable agricultural enterprise. However we should consciously avoid being trapped in this type of dispute. Our task must be to question the very necessity of these harmful input commodities (pesticides and GMO seeds) and to oppose their 'misuse'. Our critique/activity must revolve around carefully delineating their irreversible impact on soil and aquifers, and their hazardous effects on the environment, as also to guide and direct efforts to minimize such effects and impacts. Awareness of the devastating effects of inorganic chemicals has to be enhanced among the rural toiling masses so that they start rethinking their agricultural practices on the basis of traditional knowledge synchronized with modern pro-people scientific research.

If farmer suicides are any indication, then India has been reeling under a severe agrarian crisis for over a decade. In an excellent treatise Raju J Das of York University breaks it down for us[9], beginning with a definition of the two terms, agrarian and crisis, first separately and then as a unit. The term 'agrarian' refers to agriculture and its social relations; while the term 'crisis' stands for a big problem (or a set of problems) that must be addressed immediately. What are these problems? A farmer kills himself/herself every half an hour, the costs of farming are increasing much faster than the revenue generated by farming, farmers are heavily indebted, the fact that rural ecology is being destroyed by profit-driven production processes, that the state is doing far less (than it used to) for the farmers, and, that everyday 2000 people are giving up agriculture and migrating in search of emplyment. Raju further makes three counter-intuitive points. First, the agrarian crisis is not entirely about agriculture and rural areas. It is a broader problem which is manifested in the context of agriculture and rural spaces. Second, agrarian crisis is not entirely about farmers and peasants. It is also about rural labor. Third, it is also a problem of capitalism. This is witnessed in the form of the increasingly important role that private corporations play in determining policies that affect agriculture and the increase of agricultural production to feed automobiles instead of people, and the structural problems with the food distribution system or related to the increasing control multinational corporations have over the food supply system. All this is closely connected with the neoliberal model of capitalist development. The food crisis is closely connected with the social crisis and those of energy and ecology.

The agricultural crisis is going to be aggravated by twin forces: being pushed, on the one side, by the protagonists of national and multi-national profiteers and on the other by the 'natural' calamities: drought, floods, upheavals in climate, etc. But we know that natural calamities do have a primordial history and human beings have become accustomed to, and adapted to them. Our worry is how to cope with the mindless selfishness of those who add 'unnatural' elements to the 'natural' calamities. The solution to this dilemma lies in fighting against the 'unnatural' 'profit-making' practices. This fight can be waged only by the conscious and creative agriculturists in rural India who are now being trampled under the pro-big-business policies. The struggle should be supported and participated in by pro-people scientists, by intellectuals and by the urban organized working classes to ensure speedy socio-economic justice for the vast majority of our populace. This is urgent and we cannot afford to wait.

Note: The author is the Convener of Kisan Sabha (Farmer's Forum), Maharashtra Unit.

Agro-ecology: Towards a healthier tomorrow

A United Nations 2011 press release on its report ''Agro-ecology and the right to food'' states that: "Small- scale farmers can double food production within 10 years in critical regions by using ecological methods.'' Such agro-ecological methods are also safer from an environmental and health perspective. Considering that there is an absence of conclusive proof of safety, the Precautionary Principle embodied in the United Nations Rio Declaration needs to be adopted. The International Assessment of Agriculture Knowledge, Science and Technology for Development (IAASTD) Report, the world's largest study on agriculture commissioned by the World Bank , Food & Agriculture Organization, World Health Organization and other international organizations and undertaken by more than 400 scientists, found that agro-ecological approaches, and not GM, provide a sustainable answer to the world's food crisis. This has recently been further substantiated by the UN Rapporteur on Food who states ''To date, agro-ecological projects have shown an average crop yield increase of 80% in 57 developing countries, with an average increase of 116% for all African projects.'' Recent projects conducted in 20 African

9. See Agrarian Crisis as the Crisis of Small Property Ownership in Globalizing Capitalism, Raju J Das, http://mrzine.monthlyreview.org/2013/das011013.html

countries demonstrated a doubling of crop yields over a period of 3-10 years.

Agro-ecology, is a science that is based both on traditional knowledge and on advances being made by modern agricultural science (excepting, of course, transgenic biotechnology and pesticides), and utilizing elements of contemporary ecology, soil biology, biological control of pests, etc. It thus involves a **knowledge dialogue**. There are in the world approximately 1.5 billion peasant farmers who occupy some 380 million farms on 20% of the land, but produce 50% of the food which is consumed in the world at this time. (Industrial agriculture produces 30% of food on 80% of agricultural land). Of these peasant farmers, 50% practice agro-ecology. That is to say, they produce 25% of world food production on 10% of agriculture land. Imagine what the agricultural production might be if these people could use 50% of the land through a process of agrarian reform:- they would produce food in great abundance, and indeed with surpluses. The other advantage that Agro-ecology has, and which the green revolution lacks, is that it is socially activating, since in order to practice agro-ecology it must be participative and create interchange networks, otherwise it would not work. And it is culturally acceptable, as it does not try to modify traditional knowledge but instead attempts to create a knowledge dialogue. It is also economically viable because it employs local resources, without depending on imported resources. Another advantage is its greater resilience to climate change. There is also evidence that it is more resistant to major phenomena such as drought. Monoculture, which tends to dominate world agriculture, is highly susceptible because of its genetic and ecological homogeneity. The key step for a country to seriously promote and develop agro-ecological production would obviously be to introduce public policies that promote, subsidize and protect agro-ecology and small producers. Perhaps the greatest obstacle is the lack of political will, combined with the interests of the multinationals that are always pushing in the wrong direction.

Agro-ecology is most feasible for small and middle size family units, and could actually play an important role in reversing the exodus to cities. The United Nations[10] recently declared 2014 as the International Year of Family Farming, celebrating the global community of family farmers, to highlight the importance of family and smallholder farmers. Through local knowledge and sustainable, innovative farming methods, family farmers can improve yields and create a more nutrient-dense and diverse food system. They're even key players in job creation and healthy economies, supplying jobs to millions and boosting local markets.

However we must remember that even if with agro-ecology we can produce enough food to feed India, if the inequalities arising out of the structural forces of Capitalism (that explain hunger) are not resolved, then hunger will continue. There is the real danger that the whole idea might get co-opted into capitalist relations of production-and-distribution with small initiatives becoming mere decentralized production points within a supply chain that centralizes power and profits in the hands of a few multinationals. Thus what India may also need are organization(s) of ***associated producers*** who not only work to promote environmentally-conscious farming while fostering communities of people around a shared interest in sustainable agriculture, but also ensure decentralized control over production planning, and sharing of income earned– that is, work to promote biodiversity and food justice. "The moral of the tale," Karl Marx wrote in the third volume of Das Capital, "is that the capitalist system runs counter to a rational agriculture, or that a rational agriculture is incompatible with the capitalist system (even if the latter promotes technical development in agriculture) and needs either small farmers working for themselves or the control of the associated producers."

The idea merits attention. Will the Indian Government take notice?

Note: This piece has been put together by collecting and collating ideas and information from various sources.

✦✦

10. See What We Can Learn From Family Farmers in the United States, Danielle Nierenberg, Co-founder of Food Tank (USA).

News and Events

FAO urges developing nations to cut down on pesticide use

Developing countries should speed up the withdrawal of highly hazardous pesticides from their markets, the United Nation's Food and Agriculture Organization said in the wake of the death of 23 children from contaminated food in Bihar. The children died after eating a school meal of rice and potato curry contaminated with monocrotophos, a pesticide considered highly hazardous by the FAO and the World Health Organization.

"Experience in many developing countries shows the distribution and use of such highly toxic products very often poses a serious risk to human health and the environment... Highly hazardous products should not be available to small-scale farmers who lack knowledge and the proper sprayers, protective gear and storage facilities to manage such products appropriately," the FAO said in a statement.

Source: http://www.indianexpress.com/news/fao-urges-developing-nations-to-cut-down-on-pesticide-use/1148795/

Climate study for better agriculture

Snowfall in Pathankot on January 6-7, 2011, 400 mm rainfall in 24 hours in Ludhiana on August 12, 2011; -4°C in Bathinda on February 9, 2012. Coming within such a short span, these deviations from what is seen as normal for Punjab have caused alarm among agricultural scientists, who stress the need for continuous research on the impact of climate changes on the agriculture of a state whose produce feeds half the nation.

Source: http://www.indianexpress.com/news/climate-study-for-better-agriculture/1140693/0

Perishable production - Annual loss is Rs 2 lakh crore, a nationwide study estimates

About 30 per cent of vegetables and fruits produced in the country is rendered unfit for consumption due to spoilage after harvesting, according to a study whose findings come amid the debate over alleged hoarding by traders and the skewed economics of the onion crop. The annual post-harvest loss of these highly perishable commodities is estimated to be Rs 2 lakh crores and is due to lack of food processing units and modern cold storage facilities, says Associated Chamber of Commerce (ASSOCHAM).

The government admits that horticulture needs more attention and has taken some steps over the last few years but they have apparently not been enough to address wastage. The managing director of National Horticulture Board Rajendra Kumar Tiwari says that the National Horticulture Mission will be strengthened under the 12th five-year plan. Besides budgetary support, the government is focusing on post-harvest management.

Source: http://www.indianexpress.com/news/perishable-production/1165189/0

Food Act to benefit UP, Bihar, Gujarat most: Congress data

Uttar Pradesh, Bihar and Gujarat — all ruled by non-Congress parties — will be the biggest beneficiaries of the new Food Security Act. Maharashtra, Rajasthan and Jharkhand will be the next biggest beneficiaries.

The Act subsidized food grains and is touted as the big ticket reform measure by the Congress ahead of the Lok Sabha polls. In Bihar, this could help Congress strengthen ties with JD (U) and in Gujarat; the Centre would want to be seen as doing something in the face of BJP's Prime Ministerial candidate Narendra Modi's rise.

Source: http://www.indianexpress.com/news/food-act-to-benefit-up-bihar-gujarat-most-congress-data/1182226/

Farm suicides on the rise: Vidarbha Jan Andolan Samiti

In Maharashtra, the farm suicides in Vidarbha seem to be on the rise again, claimed Vidarbha Jan Andolan Samiti (VJAS), a farmers' advocacy group which has been tracking the situation for the last 15 years. Excessive rains and floods, which left land spanning lakhs of hectares waterlogged and unfit for farming, seems to have caused bouts of despair among the rain-dependent farmers of the region.

VJAS president Kishore Tiwari has charged the state and the centre of apathy and inaction in terms of providing the promised relief measures. "Not a paisa of the Rs 2000 crore relief announced by chief minister Prithviraj Chavan has reached the affected farmers and this has exacerbated the crisis," Tiwari pointed out.

Source: http://timesofindia.indiatimes.com/city/nagpur/Farm-suicides-on-rise-toll-671-Vidarbha-Jan-Andolan-Samiti articleshow/24509796.cms?intenttarget=no

Groundbreaking study links Monsanto's Glyphosate to Cancer

Glyphosate is a major component of Monsanto's Roundup herbicide. A number of scientific studies surrounding glyphosate have shed light on the danger it posses to the human body. A new groundbreaking study has now found that the most active ingredient in Monsanto's best selling herbicide "Roundup" is responsible for fuelling breast cancer by increasing the number of breast cancer cells through cell growth and cell division.

The study has been published in the*US National Library of Medicine (4)* and will soon be published in the journal*Food and Chemical Toxicology.* Several recent studies have shown glyphosate's potential to be an endocrine disruptor. Endocrine disruptors are chemicals that can interfere with the hormone system in mammals. These disruptors can cause developmental disorders, birth defects and cancerous tumors. Scientists have also recently discovered that the Bt toxins found in Monsanto's crops are damaging to red blood cells which are key to delivering oxygen to the body. They have been linked to cancer and kidney function decline. Monsanto's roundup was also linked to Autism, Parkinson's and Alzheimer's disease not too long ago.

Source: http://www.collective-evolution.com/2013/06/14/groundbreaking-study-links-monsantos-glyphosate-to-cancer/#sthash.jEUnkCFO.dpuf

Criminal proceedings against Monsanto/Mahyco and others, back on track

In a significant ruling, Justice Mr. A. S. Pachhapure of the High Court of Karnataka dismissed on 11th October 2013, petitions that sought quashing of criminal prosecution of senior representatives of the University of Agricultural Sciences, Dharwar (UAS), M/s Mahyco/Monsanto and M/s Sathguru, who have been accused by the National Biodiversity Authority (NBA) and Karnataka State Biodiversity Board (KBB) of committing serious criminal acts of bio-piracy in promoting Bt Brinjal, India's first food GMO. The petitions dismissed by the Court are those filed by University of Agricultural Sciences, Dharwar,

Dr. R. R. Hanchinal, Vice Chancellor and Dr. H. S. Vijaykumar, Registrar of the University (CRL.P 10002/2013) and a connected petition (CRL.P 10003/2013) filed by a former Vice Chancellor of the University Dr. S. A. Patil, who also served as Chairman, Karnataka Krishi Mission and Director, Indian Agricultural Research Institute, New Delhi.

The direction of the Karnataka High Court in dismissing these petitions results now in restoring the status of the criminal complaint before the JFMC Dharwar against the accused.

Source: Leo F. Saldhana (email: leo@esgindia.org), Bhargavi S Rao (bhargavi@ esgindia.org), Arthur Pereira. The Applications and related documents, along with a copy of the order of the Tribunal dated 21st March 2013 are accessible on the ESG website at: www.esgindia.org

✦✦

Debates, Perspectives and Analysis

Biotechnology Regulatory Authority India Bill 2013

Article 21 of the Indian constitution guarantees every citizen the right to life and personal liberty. Also Article 51 A (g) states that it is the fundamental duty of every citizen to protect and improve natural resources. The Supreme Court of India has stated that the **Right to Life** essentially means the right to live with human dignity, which includes the right to food and other basic necessities. It also interpreted that Article 21 guarantees citizens the right to environmental protection.

The Biotechnology Regulatory Authority of India Bill (2013) was drafted by the Ministry of Science and Technology and tabled in the parliament on 23 April 2013. One can examine various aspects of the bill such as the objective, the process of drafting the bill, the authors of the bill, who will implement it, how it will be implemented, who the beneficiaries are, who might be adversely affected, what will the penalties for infraction be, who will bear the actual cost of negative impacts, how widespread the impacts might be, and above all, whether citizen would have the power to safeguard herself against such impacts.

Let us examine whether the BRAI Bill, 2013, does indeed enable the fulfillment of this duty and ensure the fundamental rights of citizens in India. Over the last thirty years scientists have been trying to understand the possible impacts of biotechnology. This technology essentially manipulates genetic material in order to create organisms (plants, animals, bacteria, etc.) that could have industrial applications in various sectors. Some example of such technology include golden rice (rice rich in vitamin A), Bt Cotton (cotton that produces chemicals that purportedly kill pests), fluorescent fish etc. In general the transgenic combination could be one of three kinds- animal-animal, animal-plant, plant-animal-human. Thus, industrial applications of biotechnology are to be seen in sectors like agriculture, pharmaceuticals, veterinary products, processed foods, etc. and are all-pervading. There are very serious ethical and moral questions here. Is an animal bioengineered with a human gene to be considered human? Are we crossing species boundaries and do we have the right to play God? Do transgenic animals suffer? Could this lead to the creation of a slave race of humans? And so on. Equally relevant is the question of the impact of this technology on human health and society.

It is now accepted that the impact of living modified organisms (LMOs) cannot be completely predicted. Any scientist who makes a prediction does so with a degree

of confidence which is under 100%. For example when a transgenic crop contaminates a traditional crop, the impact on various pests and on the food chain cannot be predicted. There is also the possibility of diseases crossing the species barrier. Thus they could affect both wild and domestic biodiversity and impact human health in the short term and the long term. Most importantly many of the changes would be irreversible – for example the extinction of a species. Bioengineered crops could impact the entire food chain and the end user may not have the liberty to reject the transgenic organism/crop/product thereof.

The objective of this bill is to "promote the safe use of biotechnology through effective and efficient implementation." Inherent in this objective is the unstated and implied fact that biotechnology may not be safe and that it needs to be regulated. The question is, can a citizen isolate him/herself from this technology – a technology that involves labeled LMO, non-labeled LMO and the direct or indirect usage of these in crops, and processed foods? The answer is clearly negative. Even if such labeling of GMOs were to be made mandatory, we will never know how they might interact with one another, and we would have no way to prevent them from entering our bodies. For example, cheese made from the milk of a cow which has been fed LMO does not have to be labeled. It would be impossible to say how this might affect our immune systems. A reading of the bill gives a clear answer that the promotion of **"safe use"** of biotechnology through effective measures goes against the right to personal liberty and also the duty to protect one's own life.

The recently legislated Food Security Act (2013) aims to ensure that citizens have an adequate supply of food. Well-planned implementation will guarantee that a substantial percentage of people who are in dire poverty will be able to live, and thus the right to life and personal liberty guaranteed by the constitution will be upheld. While questions have been raised about the process of ensuring the right to food, there is no inherent contradiction with personal liberty which the constitution guarantees.

Thus the question arises – What could be the motivation for drafting mutually contrary bills, one of which provided for human life and dignity, and, the other that goes against the fundamental right to personal liberty and the right to eat food of one's choice? This bill cannot be seen in isolation; it has to be understood in the context of a spate of seemingly contradictory developments such as Patent (amendment) Act, 2006, which enables process and product patents to be obtained, and allows patenting of micro-organisms; and the Seeds bill which will help biotech companies to market their seeds at the cost of biodiversity and that of a long-standing tradition that helps save and distribute fertile seeds, at no monetary cost, among farmers. If this bill is passed it will have a tremendous impact on rural health and on the environment. It will also seriously compromise personal liberty and the freedom to choose.

Contributor: Shantha Bhushan (shantha.s.bhushan@gmail.com); Associate Prof., FLAME, Pune, and member, Kalpavriksh Environment Action Group (www.kalpavriksh.org).

GMOs - Concerns & Impacts

Genetically Modified Organisms(GMOs), also known as Living Modified Organisms(LMOs), are products of modern biotechnology (transgenic technology/genetic engineering/recombinant DNA technology) prepared by altering genetic material (DNA) through insertion of different genes of unrelated species to achieve a desired trait in a species, in a way that does not occur naturally; e.g. fish genes in tomato plants. These organisms are expensive and patented by developers – Biotech Companies which are usually also seed/agro chemical/pharmaceutical companies.

Use of GMOs in Agriculture, Forestry & Fishery sectors is a very controversial issue because introduction of GMOs in food and in the environment is risky and irreversible. Currently much research is focused on development of GM crops to obtain specific traits; crops sought to be made insect resistant, or to be made to withstand herbicides (Herbicide Tolerant – HT), or to be made drought resistant or to be made virus resistant, etc. 90% of GM crops are developed as Bt crop or as HT crop. A Bt seed is developed by inserting a gene of soil bacterium (Bacillus thuringensis – Bt) into a plant variety to create Bt toxin in every part of the plant throughout its lifetime, intended to make it capable of killing one particular insect. Whereas an HT crop is developed by inserting a gene from a bacterium into a plant variety so that the crop can withstand herbicide sprayed to kill adjoining weeds, for e.g. roundup ready crops. In both the cases, a few additional genes (used as promoters, markers, reporters, and terminators) of unrelated species are inserted into the host DNA to ensure expression of the desired trait.

GM crops are promoted using aggressive marketing strategies promising miracle yields, low pesticide use, prosperity, and purported to be the only technology to ensure world food security, etc. Truth is that GM crops are

no miracle crops and have often failed to benefit farmers, especially the small and marginal farmers, causing more trouble than they provide relief. India needs to be much concerned about this fact, for the sake of the huge number of marginal farmers with 1-2 acres land holdings. Adverse impacts of GMOs on health, nutrition, environment, non-GM species, biodiversity, non-targeted insects/plants, soil & soil micro-organisms, water, agrobiodiversity, seed availability and pricing, farm and farming, livelihoods and socio-economic structure are emerging.

Presently an area of only 3.4 % of all the agricultural land in the world is under GM crops (largely Bt Soy, Bt Corn, Bt Canola and Bt Cotton), mainly in five countries (USA, Brazil, Argentina, Canada, India). Observations in the cultivation of Bt Cotton, the only GM crop widely grown in India to date, reveal the following:

1. The target insect species (Ballworm) has developed resistance to Bt toxin in the Bt Cotton, which was intended to kill it. As a result the companies have developed more toxic Bt Cotton than earlier - so far we had Bollgard I, Bollgard II (gene stacked), and now we have Bollgard III (3 gene). World environment is in peril due to newly emerging 'super bugs' and 'super weeds' that have developed resistance to GM crops designed to kill them.
2. There has been an increase in the use of pesticides due to the target pest having developed resistance for them, as well as a rise in secondary pests like mealy bugs, white flies etc.
3. Bt Cotton has failed in regions practising rainfed agriculture (Vidarbha and Marathwada of Maharashtra)[11].
4. Bt Cotton seeds are expensive and the monopoly on Bt Cotton seeds has impacted seed prices to such an extent that there have been court cases between companies and state government over price regulation issues[12].
5. Traditional varieties of cotton seeds (i.e. Non-Bt Cotton seeds) are NOT available in the market anymore. Farmers have no choice but to buy the expensive Bt Cotton seeds. The reason is market monopoly as well as loss of seed diversity since everyone started growing just one variety. Maharashtra, through the Central Institute of Cotton Research (CICR), is looking for alternatives to Bt Cotton.
6. Livestock deaths were noted due to grazing on Bt Cotton plants. The Andhra Pradesh government appealed to farmers not to graze livestock on Bt Cotton fields.
7. Farmer suicides have become the norm, especially in the cotton belt and most such cases involve small and marginal growers of Bt Cotton .
8. There is no increase in the yield of cotton. According to news reported in 2012, Maharashtra State Government has officially admitted that cotton yield is likely to reduce by nearly 40%. Bt Cotton failure in more than 4 million hectares of land has reduced cotton yieldin the state from 3.5 million quintals to 2.2 million quintals. The state has had to pay Rs. 2,000 crore to 4 million cotton farmers as compensation.
9. Organic cotton growers have faced rejection of their produce due to cross contamination from Bt Cotton. The Ministry of Agriculture of India admits that GM & Non-GM crops/farms cannot co-exist.
10. Bt Cotton was never tested for human safety as it is not a food crop; but farm and mill workers complain of allergy due to Bt Cotton.
11. Though not a food crop, Bt Cotton is still being consumed in form of Bt Cotton seed oil, Bt Cotton seed milk and indirectly through consumption of the milk of cattle feeding on Bt Cotton seed cakes. The reason for the rise in illnesses needs investigation in the context of the fact that Bt Cotton is now a part of our diet.

Since 2010, Bt Brinjal, the first food crop considered for commercialization in India, faces a moratorium for an indefinite period due to serious concerns raised by State Governments, by Indian as well as International Scientists and by the public by large. The decision note by Minister of Environment and Forests clearly states that simpler methods available, such as Non-Pesticidal Management (NPM) practiced by lakhs of organic farmers of Andhra Pradesh, has to be adapted instead of converting the brinjal plant into a pesticide.

Till date various Government Reports [2004 Task force on Biotechnology in Agriculture, 2010 moratorium note on Bt Brinjal by MoEF, 2012 Parliamentary Standing Committee on Agriculture Report, 2012 Western Ghats Expert Ecology Panel, 2012 Interim Report & 2013 Final Report by Supreme-Court-appointed Technical Expert Committee (TEC)] have recommended that Regulatory failures should be addressed, all GM crop field trials should be stopped, long term and inter-generational

11. See http://www.thehindu.com/news/national/study-questions-sustainability-of-bt-cotton-in-waterstarved-vidarbha/article3563411.ece
12. See: http://business.rediff.com/column/2010/apr/01/guest-bt-cotton-monsanto-is-back-in-courts-over-royalty.htm, http://www.business-standard.com/article/markets/bring-down-seed-prices-gujarat-tells-bt-firms-108042401016_1.html, and http://indiagminfo.org/wp-content/uploads/2012/03/Bt-Cotton-False-Hype-and-Failed-Promises-Final.pdf

safety tests should be carried out, there should be no development of GMOs in species of Indian Origin, the Precautionary principle should guide decisions in this field, and Biodiversity should be safeguarded from gene-contamination. Many citizens question the very need for GM crops/foods, for simpler alternatives are available.

India cultivates enough to feed the entire nation, and even while significant portions of its food stock rots every year, there is no dearth in food variety, as India's seed-biodiversity is one of the richest in the world. Besides, India is a centre of origin for many plants and hence we cannot put these plants to risk through irreversible GM technology.

Contributor: Tejal (tejal.roots@gmail.com) is a citizen actively involved in ecology and environmental awareness and conservation.

WTO Negotiations: India's victory – Myth or Reality?

1. Indian negotiators have placed the country's entire stockholding of food under external scrutiny and have lost sovereign control over decision-making regarding buffer stocks. WTO's Committee on Agriculture (CoA) to now monitor India's grain stocks.
2. India will have to freeze its minimum support price (MSP) and will be unable to either raise the MSP or add new crops to its stocks after it has submitted the complicated and embarrassingly detailed forms on public stocks held by Central and State governments.
3. Enormous paperwork and implementation costs have been added to maintaining our public stocks, money that could have been spent more profitably elsewhere.
4. India will have to freeze the structure and modalities of food procurement now and will be unable to make changes without the permission of the CoA. This is not only humiliating, it has introduced the dangerous precedent of foreign interference in our food security strategies. India after Bali has lost the right to use public food reserves as a plank of its food security.
5. India has also effectively sealed off for itself any avenues to support its farm sector, improve food production and secure the livelihoods of its small and marginal farmers, without invoking howls of protest from the CoA and the denizens of the WTO.
6. Trade Facilitation stays in place. This will mean "facilitating" the entry of foreign products into the Indian market. Opening India's market to agricultural produce has long been the goal of the large agriculture exporting countries, especially the US and EU. That goal is close to being realised. India has so far managed to fend off large-scale dumping of agricultural produce but that may be coming to an end.
7. After Bali we should expect an influx of heavily subsidised agri produce from outside. This will knock the stuffing out of Indian farmers already reeling under adverse domestic policies and the utter neglect of the agriculture sector. Trade facilitation for genetically modified products will almost certainly be on the menu, if for no other reason than to break the back of the domestic resistance to GM crops and foods. But also because the major agriculture exporters are sitting on stocks of GM corn and soya and there are other products in the pipeline, all waiting for markets.
8. Unable to compete with the heavily subsidised farm products from the US, Canada, Australia and the EU, the Indian farmer will be forced to abandon his fields and swell the slums of cities. Apart from the supply to the open market, who (Cargills and Bunges?) will produce the stocks of cereals needed to keep the Food Security Act in motion?
9. It has put India in the dock, under public scrutiny, tied its hands behind its back and taken away options for the betterment of the farm sector and for future food security.

Source : Excerpted from **How India sold out to the WTO**, Suman Sahai (Gene Campaign), The Aisan Age, http://www.asianage.com/columnists/how-india-sold-out-wto-888

BRAI 2013 in service of Biotechnology Companies

Modern biotechnology has some inherent risks. The claims made by GMO producers, that genetically modified crops will provide more yields or will require fewer applications of chemical fertilizers and pesticides have not been validated, and are therefore unscientific. This still is a controversial technology as its safety standards are yet to be established.

Thus the very objective and mandate of the BRAI bill *"To promote the safe use of modern biotechnology by enhancing the effectiveness and efficiency of regulatory procedure" is* problematic. The bill was drafted by the Ministry of Science and Technology (MoST). The framework and implementation strategies have been designed from an industrial perspective, ignoring socio-environmental perspectives.

Issues related to modern biotechnology are relevant all over India. Thus, the setting up of a central authority like the Biotechnology Regulatory Authority (BRAI) is justified for ensuring uniformity across states. However, this too, is problematic as the state governments will now be forced to go by the BRAI regulations even though agriculture is a state subject. How this tension will be resolved is the moot question.

The provisions of this Bill ignore the autonomy granted to various bodies under the 73rd and 74th Amendments to the Indian Constitution. There is no definition of the role of the various Panchayats, and about their sovereignty to implement decisions contradicting those of the BRAI. This Bill is also in clear contradiction to the mandates of the Biological Diversity Act, 2002 (No. 18 of 2013)[13], the Environment (Protection) Act, 1986[14] and The Right to Information Act, 2005. There is lack of clarity on the final decision-making authority in case of any conflict.

The members of the BRAI are required to be experts in biotechnology. As such, they would not have the capacity to address social and environmental problems. Considering the risk this bill puts society and environment at, this is indeed strange! To make matters worse, the selection of the members of the Appellate Authority is neither transparent nor will it avoid conflict of interest.

Currently, most biotechnology companies are 'large multinationals' which are actively introducing new GM crops in India. The penalties imposed by the Bill on defaulters are very meager. It would be easy (and well worth the profit!) for such companies to violate the law, pay the penalties and continue with their unwarranted tests, and marketing of unsafe products. Also, the Bill is silent on the issue of liability in case of accidents in connection with GM products (processing, handling, transporting). There are no specific provisions regarding liability in case of short term or long term impact of GMOs.

Since biotechnology is relevant to matters of public interest – agriculture, forest, fisheries, human health and others, it should be mandatory that the relevant information be made available for public discussion and scrutiny. However, the BRAI Bill states that information will be publicly disclosed only if it does not harm any person. Does this not imply that all information on harmful products / aspects is to be kept secret by law? This is bizarre! No specifications are given as to who is the 'person' being referred to – the consumer, the farmer, a middle-man, a trader or merchant either selling or refusing to sell GM crops, an employee of the government or of the company, a member of the BRAI or the Appellate Authority, or the owners and the management of the company(s) in question – would be.

The BRAI has the power to call for information, conduct an inquiry and issue directions for the safety of the products and the processes of modern biotechnology, to inspect field trials, etc. The magnitude of power vested with a single organization is phenomenal, and hence problematic.

This Bill raises a very fundamental question - Is the BRAI for public good and in public interest, or, is it in the interest of biotechnology companies? This Bill is weak, not well thought of and has gaps and inconsistencies.

Contributor: Radhika Mulay (radhika.mule@flame.edi.in) is a final year B A student at Foundation for Liberal and Management Education (FLAME), Pune. This piece was written in September 2013 as part of the environment law course in FLAME.

Flaws, Gaps and other issues with BRAI Bill

The 'Biotechnology Regulatory Authority of India' (BRAI) Bill was introduced in the Lok Sabha on April 23rd, 2013, by the Minister for Science and Technology, Mr. S. Jaipal Reddy. The aim of this bill is to promote the safe use of modern biotechnology by enhancing the effectiveness and efficiency of regulatory procedures. Given below are issues that need looking into -

1. **Not strong enough reason to reject previous mechanisms and pass BRAI bill** - The present regulatory mechanism for genetically engineered organisms in the country is the 'Rules for the manufacture, use, import and export, and storage of hazardous micro-organisms or cells', 1986. The agency for this is the Genetic Engineering Appraisal Committee (GEAC) created by the ministry of Environment and Forests. Why then is the new system proposed under BRAI considered to be better than the existing system?
2. **Qualification of members of the committees -** Even though there are a number of bodies set up to advise the BRAI, the final decision-making rests with the BRAI. Clause 6(2) of the bill requires the BRAI committee members to be qualified in the domain of science and technology, leaving out fields of anthropology, social sciences, environment and public health. It is very important to have experts from these backgrounds participate in the decision making process.
3. **Lack of long term assessment plans -** There is much evidence that suggests that the impacts of GMO crops may adversely affect the population in the long term. The BRAI bill lacks planning for long term assessment of these GMOs.

13. Objective: "An Act to provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto."
14. Objective: "An Act to provide for the protection and improvement of environment and for matters connected therewith." The act was last amended in 1991.

4. **Limited disclosure of information -** This bill states that there is information that is privileged and excluded from the Right to Information Act. Thus BRAI may legally take decisions in a non-transparent and non-democratic manner.

5. **Limited Public participation** - The BRAI may obtain objections and suggestions from the public for a limited period when an application for authorization or manufacture and use of organisms and products specified in the clause is received. This is a dubious clause. India has already seen farmers protesting against Bt Brinjal and Bt Cotton and that has not stopped the government from drafting a bill that has a mandate of promoting biotechnology.

6. **BRAT Vs NGT -** The Biotechnology Regulatory Appellate Tribunal (BRAT) is a body that will hear grievances regarding decisions made or orders given by BRAI. The National Green Tribunal (NGT) hears appeals regarding judgments and orders passed by various courts and has the last word regarding environmental decision making. As the impact of biotechnology on environment and human beings will be significant, appeals should ideally be heard by NGT. Since the BRAI b**ill is a** piece of legislation being drafted after the NGT Act (2010), is it to be assumed that it supersedes the provisions of the NGT Act and that the decisions of the BRAT will be final?

7. **Penalties insufficient and no liability clause** - The penalties prescribed for providing false information (imprisonment for three months and fine extending to Rupees five lakhs) and conducting an unapproved field trial (imprisonment for six months to one year and a fine extending to Rupees two lakhs). These are grossly insufficient given that there could be long-term or short-term impacts on biodiversity and human health. There is no liability clause in this bill. This is a grave and serious omission.

Conclusion

In the absence of transparency, absolute liability and strict penalties, and overriding the 'Polluter Pays' principle, the BRAI bill poses a grave risk to humans and other life forms in India and elsewhere.

Contributor : Diva Singh (diva.singh@flame.edu.in) is a final year B A student at Foundation for Liberal and Management Education (FLAME), Pune. This piece was written in September 2013 as part of the environment law course in FLAME.

✦✦

Case Studies

Towards reviving millets-based bio-diverse farming system for food sovereignty

Millets are highly nutritious food crops with a relatively low demand for natural resources like water and soil nutrients as compared to that of other cereals. They are also resilient to climate changes. Unfortunately, over the recent years, areas where these crops are being cultivated have now declined, as the state agriculture policy promotes cultivation of paddy and certain other crops, ignoring the multiple benefits of millets. NIRMAN, a grassroots organization working in Odisha, has made a successful attempt at reviving some of the millets with the active participation of the Kutia Kondh tribal community of Kandhamal and Nayagarh districts.

Background

In 2011, NIRMAN undertook a study on millets in Dupi Village in the Guma grampanchayat of Kandhamal district. The study showed a decline in the traditional millets-based bio-diverse farming system and its impact on food and nutrition security at household level. Several consultations were held and it was felt that millets have the potential to address issues of rise in temperature, water scarcity and malnutrition. This prompted NIRMAN to intervene in state-promoted farming and to help conserve the agro-biodiversity heritage.

Kandhamal: The Intervention Areas

In January 2012, NIRMAN intervened in 14 villages covering 306 households of Gumma gram panchayat of Tumudibandha block of Kandhamal district. All the villages are located south-west of block headquarters at Tumudibandha at altitudes varying between 2000 ft. and 3000 ft. They are at a distance of 18 to 30 kilometres from Tumudibandha and connected with it by motor-able roads.

Of a total population of about 8,000, the schedule tribes (ST) account for about 70%; most belong to the Kutia Kondh community, a Particularly Vulnerable Tribal Group (PVTG). Estimates put the number of households below the poverty line at 82%. The settlements of this community lie in the remote hills and they earn their livelihood through agriculture, mostly under rain-fed conditions. Some shifting cultivation is undertaken along hill slopes (locally known as *poduchasa*). People also depend on sale of Non-Timber Forest Produce (NTFP) collected from forests and around 15% of their annual income is derived from NTFP sale. Wage-earning and

migration to cities as wage labour also contribute to their livelihoods. Their economy centres on the '*gudia* and *padar*'[15] cultivation; hill slopes and valleys and the *padar* are the abode of their deities.

Working with the Kutia Kondh Community

The Kutia Kondh community has a long and rich tradition of mixed farming. Earlier they were growing 40-50 diversified varieties of crops through mixed farming. These practices were widespread until 20-25 years ago. However, with the onset of the green revolution, due to the increased availability of subsidized agricultural inputs for paddy cultivation, and with the domination of rice in the Public Distribution System (PDS), the cultivation of diverse millets and the associated legumes as intercrops suffered a setback. The number of varieties cultivated had come down to 12-13 by 2011. The per capita intake of nutrition declined. This worsened the food security situation for the district[16], which was categorized under *Extremely Food Insecure* by UN World Food Program and Institute of Human Development in 2008. According to the community, they were forced to purchase food (especially rice) for at least 200-210 days per year. This makes them dependent on local money lenders and other external sources to meet their food grain needs.

Restoring Millets-based bio-diverse farming for livelihood Security

NIRMAN conducted regular village-level meetings with the community to discuss the food and nutrition insecurity issues and possible changes in the farming practices to remedy the prevailing situation. The community realized the need for a revival of millets-based farming and decided to build village-level institutions (VLIs) so that the community would be able to procure and assess the seed required. Fourteen village-level institutions were formed. These village institutions set up millet seed banks.

A community-led approach was adopted where village-level institutions asserted their control over the food production system, working to improve livelihoods by establishing seed banks, sharing knowledge with the community through learning sessions and exposures, and to revive the millets-based bio-diverse farming system. Community groups assessed the requirement of seeds. NIRMAN arranged for procurement of 12 varieties of seeds from various sources for the community as an act of one-time support to the community, which was then transferred to the VLIs as seed capital to establish the seed banks to meet the requirement of the community. With the availability of these seeds of locally lost varieties, the length of the planting calendar has increased and the community now gets a better yield, resulting in food security for an additional 45 to 60 days, bringing, at Kutia household level, the number of days when food is available to over 200 per year.

Nutrition, Seed and Women: Women were encouraged to play a major role in the implementation of the program. At VLI meetings, the community elected women as office bearers. Women were actively involved in the discussion on selection of the varieties of seed to be cultivated for meeting household requirements, actively participating in the assessment, procurement and distribution of seed among households. In a single crop season a total of 25 crop varieties were revived.

15. The hill and the surrounding terrain near which the community has settled.
16. Annual Health Survey 2010-11, Govt. of India; The Samaj, a premiere Odia daily, Page-10, 28th February 2012 (Bhubaneswar edition).

Bio-diversity festival

After the crop harvest, the Kutia Kondh community celebrates, at village level, the Burlang Yatra (seed festival). The concept behind the festival is to express gratitude to mother earth and to the seeds through which they have raised the crops and obtained food. After this revival of crop diversity by Kutia Kondhs, a common festival was organized at Gram Panchayat level. This was a unique way to celebrate the revival of agro-biodiversity through a display of various local seeds, farming practices and the life style of the community. The local seeds displayed included millets, pulses, rice, oilseeds and vegetables. In addition to this display, there was an exchange of seeds, experience and knowledge on farming practices among members of the community and farmers coming from various parts of the state and the neighboring state of Andhra Pradesh.

Engagement with state and district administration

Concerted efforts have been made for engagement with government officials at the district and state level through workshops and consultations. More efforts would be required to bring about appropriate changes in policy and programs of the state.

Reaching out

For disseminating the information on multiple benefits of a millets-based farming system, posters were developed and distributed within village. A newsletter titled **Krushak Swaraj** also brought out special issues on millets on the occasion of the festival.

Introducing millets-based foods in mid-day-meals (MDM):

Efforts are now being made for inclusion of millets in two important food rights programs for children i.e. MDM and Anganwadis.

Accomplishment

Re-establishment of the millets-based farming system has increased crop diversity in the agricultural fields of 14 villages from 13 to 25, and has added to the food security basket at household level. The seed-scarce community has become seed-sufficient. The most important accomplishment has been the restoration of the traditional knowledge base which had eroded along with the degradation of crop diversity. With engagement with govt. officials, opinion makers and the media, a debate on millets has been initiated. This should help to mainstream this discourse in the state of Odisha.

Way Forward

- Establishment of a network of similar practitioners across panchayats, blocks, districts and states so that the voice of the communities reaches the administration, and brings about a change in the agriculture policy-plan-programme scenario. In addition, it is largely felt that orienting the community on micro-and-macro-issues related to millet crops can bring community voices to the state / national level debate.
- Inclusion of millets in mid-day-meal and Anganwadi.
- Organic Certification under PGS.
- Value addition, market linkages and strengthening Women's Collectives.

Conclusion This experiment by NIRMAN offers solutions to today's crises of farming, food and nutritional security in semi-arid areas in Kandhamal district, and has the potential to provide learning for other semi-arid areas nationwide. The model has great adaptive strengths to meet the challenges of erratic rain fall and climate change, and could ensure more resilient agriculture system.

Contributor: Prasant Mohanty (email: prasantmohanty@gmail.com), is the founding member of NIRMAN and currently serving as Secretary Cum Executive Director.

Contact Details: NIRMAN, Plot- S-3/751- Niladri Vihar,P.O.- Saileshree Vihar,Bhubaneswar -751021.
Ph: 674 – 2720417/ 9438294417**, Website:** http://www.nirmanodisha.org/ourteam.php.

Medicinal Rice – An unknown treasure

Sahaja Samrudha, an association of organic farmers, has identified and documented the medicinal rice diversity of Karnataka and has come forward to restore and preserve the diversity. Sahaja Samrudha in collaboration with **Save Our Rice** campaign has developed a connectivity network of consumers and producers for procurement and marketing of medicinal rice under the brand name "Sahaja Organics".

Rice is Asia's most deeply revered treasure. Rice is life for millions of people. It is deeply embedded in the cultural heritage, spirituality, traditions and norms of Asians. Rice, over the centuries, has sculpted the culture and traditions of India. This grain has been the link between heaven and earth, and between humans and gods and all festivals and rituals.

We find information on **rice culture** covering the last 5000 years in the Vedas, Samhitas, Puranas, Buddhist and Jain literature, Kautilya's Arthasastra, Krishi-Parashara, Kashyapiyakrishisukti and a few others. The earliest text to mention Rice is the Yajur Veda (1500-800 BCE) and it is frequently referred to in later Sanskrit texts. According to Charaka and Susruta we find more information on rice in the context of human health.

In the Vedic period rice was recognized for its medicinal properties. The uses of rice in traditional medicine are closely interwoven with its use as a food. The main rice products used as medicines are made from a few varieties that have medicinal value. Some of the traditional uses of rice are supported by scientific studies.

Karnataka too had a host of medicinal rice varieties that were cultivated many decades back. The versatility in climate, soil, topography and method of cultivation in Karnataka has made the state a source of diversity in rice. In a few places in Karnataka there has been an ancient practice of utilizing paddy varieties for medicinal purpose, although not highlighted. Among the medicinal rice varieties, *Karibattha, Kalame, Karikalave, Ambemore, and Sannakki* are some of the prominent varieties.

- *Karibatha* grown in Varada river basin of Sagara and Soraba division, has medicinal value that is used to cure Herpes(Sarpa suttu). *Karibatha* rice is pounded and mixed with jaggery and consumed as a tonic to keep the body cool. For any skin ailments a paste is prepared using flour of this rice variety mixed with red soil and lemon juice and applied to the affected area. This variety is a rare ecological adaptation - it can withstand submersion in flood water for a month.
- *Kalame*, grown in the coastal region of the state, is very tasty and it can cure piles (Mulaavyadi). This variety is stored for a longer period, because it is believed that the older the paddy the greater is its medicinal value. Karikalave is specific to Gulbarga and Bidar regions. Usually pregnant women and mothers are not fed with this variety of rice. Besides, it can control acidity and cold.
- *Sannakki* is yet another variety that has medicinal value and is used to cure Diarrhea in children. It is grown around areas of Sirsi and Mundagodu of Uttar Kanara District. The variety is very fragrant and ideal for preparation of Biryani, Payasam and Kesari bath. '*Athikarya*' is another among the oldest varieties that find references in our folk traditions. There is an old saying that the variety was considered to be a sacred crop, and the tradition is for a fist-full of these grains to be held while taking an oath. This variety is also used to cure diarrhea.
- *Ambemore* is grown by a few farmers in rain-fed areas of Belguam district. When cooked, this variety of rice has a pleasant aroma and is very soft. Porridge made from this variety is given to sick people in villages. The dry-land variety of paddy, '*Doddobatha*', is grown in rural Bangalore and in Kolar district. It is popular for its curative values for various diseases. A traditional sweet '*burfi*' is prepared by pounding the rice and extracting a milky paste, to which jaggery is added. This variety is used with curd for curing diarrhea. *Karinellu* is another variety grown in Kanakapura taluk of Bangalore district, and is used as medicine for jaundice.

Some of the traditional uses of rice are supported by scientific studies. Rice can be used to treat skin conditions, boils, sores, swellings and skin blemishes. Other herbs are sometimes added to rice balls to increase their medicinal effects. Sticky glutinous rice is often consumed to treat stomach upsets, heart-burn and indigestion. Extracts of brown rice have been used to treat breast and stomach cancer and warts. They have also been used to treat indigestion, nausea and diarrhea.

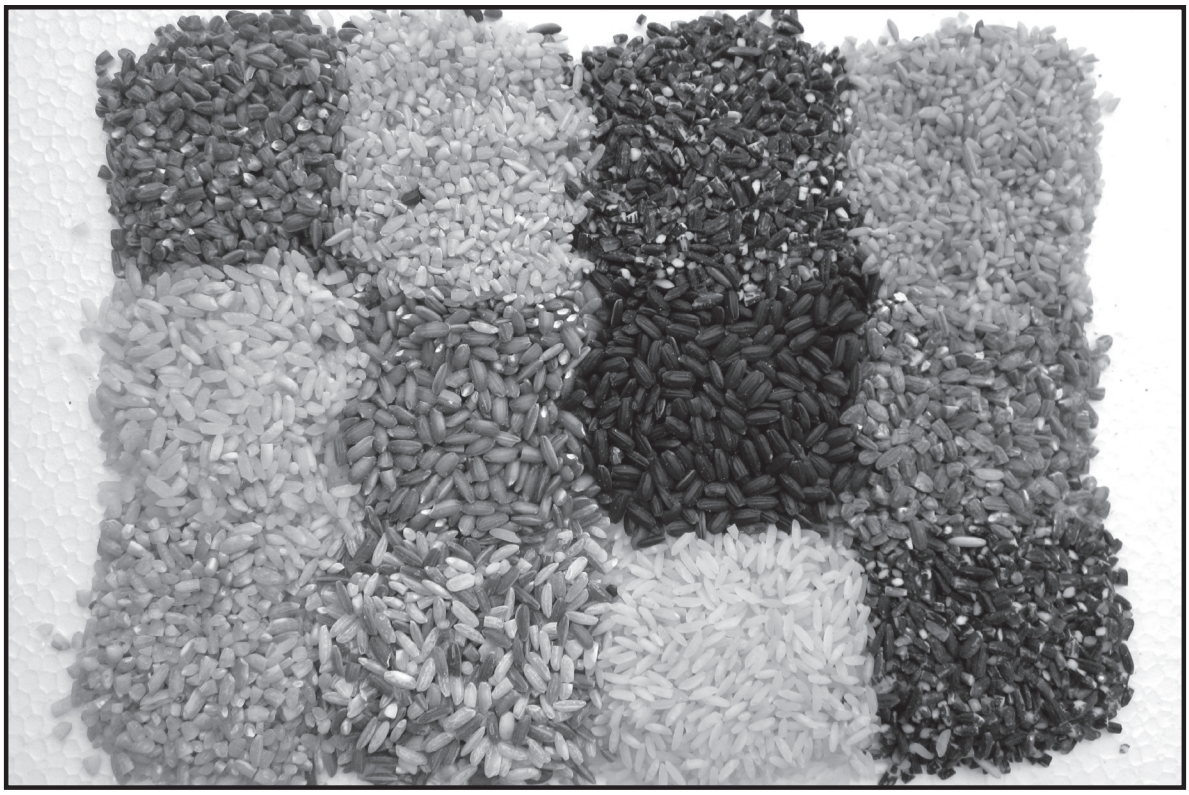
Now only the older generations are aware of these medicinal properties, while the younger generation remains ignorant of them. Unfortunately, the entire range of genetic resources are on their way to becoming extinct, as the crop species are no longer cultivated. Reviving and restoring this valuable resource is most important, lest we lose this wonderful medicinal and cultural heritage.

Contributor: Anitha Reddy (reddyanitha88@gmail.com) is a researcher and freelance writer and has won the prestigious international 'ASIA PACIFIC RICE JOURNALIST AWARD 2009'. At present she is the Associate Director of Sahaja Samrudha.

Contact details: Sahaja Samrudha, No-7, 2nd Cross, 7th Main, Sulthanpalya, Bangalore – 560032.

Ph: 2365 5302 / 9880862058, **Website:** www.sahajasamrudha.org

✦✦



Note to the reader:

In case you want to receive People In Conservation at a different address, please email your new address at **kvoutreach@gmail.com**, else please send it by post at the following address:

Kalpavriksh,
Documentation and Outreach Centre,
Apt.5, Shree Dutta Krupa, 908, Deccan Gymkhana,
Pune 411 004, Maharashtra, India.
Website: www.kalpavriksh.org

People In Conservation - Biodiversity Conservation and Livelihood Security
Volume 5 Issue 2 April 2013 - October 2013

Compilation and Editing: Milind Wani

Advisor: Neema Pathak

Editorial Assistance: Anuradha Arjunwadkar, Sharmila Deo, Pankaj Sekhsaria, Seema Bhatt.

Cover Photograph: Prasant Mohanty, Krishna Prasad, Anitha reddy

Other Photographs: Prasant Mohanty, Krishna Prasad, Anitha Reddy

Puclished By: **Kalpavriksh**

Apt. 5 Shree Dutta Krupa, 908 Deccan Gymkhana, Pune 411004

Phone: 91-20-25675450, Tel/Fax: 91-20-25654239

Email: kvoutreach@gmail.com

Website:www.kalpavriksh.org

Funded By: MISEREOR, Aachen, Germany

For Private Circulation

Printed Matter

To: