AGRICULTURE AND CONSERVATION

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Presentations

Rhys Green of RSPB and the University of Cambridge, UK, discussed reconciling crop production with biodiversity conservation. Agriculture is one of the biggest threats to biodiversity because it leads to extensive loss of habitat and the pesticide usage leads to environmental degradation. Agricultural environmentalists attempt to reconcile the two through two main practices – Land Sparing and Wildlife Friendly Farming.

Land Sparing concentrates on high intensity inputs and productivity on a portion of the land, leaving the remaining land free for biodiversity conservation. Land sparing, if followed properly, would have been successful in its objective. In practice, however, often when land is left uncultivated for biodiversity conservation, it is used for non-conservation processes like building roads and houses. This severely affects the feasibility of this form of biodiversity conservation.

Wildlife Friendly Farming is low in production and yield, but beneficial for the wildlife in the area. However, Wildlife Friendly Farming does not leave much land empty for pure biodiversity conservation. Both methods are likely to lower financial profits and farmers are compensated for economic losses that they suffer in order to help species survive. The viability of these methods also depends on the ecosystem of the area. Studies must be conducted before a method is chosen. With global food demands growing by two to three times by 2050 it is essential that we find methods of farming that can cater to the growing needs of the world as well as help conserve biodiversity.

Vijay Jardhari of the *Beej Bachao Andolan* (BBA, or Save the Seeds Movement), presented his experiences with conserving agro-biodiversity (agricultural biodiversity), in his village Jardhar in Uttarakhand, India, and in other parts of the region through the BBA. He tracked the changes in perceptions and methods of farming. Traditionally, farming was an esteemed profession and soil was a precious resource that had to be valued. It was treated like a living entity that needed nurturing and nourishment. Organic methods of farming were used that naturally let crop biodiversity flourish and kept the soil healthy.

Around 40 years ago, the Indian government propagated the use of high yielding varieties (HYV) of crops by doling them out at subsidised rates. These varieties needed chemical fertilizers and slowly changed the entire system of farming that originally existed. Initially people were surprised by the substantial increase in productivity, but over a period of time they realised that the yield stagnated or reduced with every year while the need for expensive and harmful chemical fertilizers and pesticides increased. The people of Jardhar decided to revert back to their traditional practices of farming. The main method they used was the *Baranaja* system where a variety of crops and plants are grown together in what seems to be an incoherent and random melee, but the system is a time-tested method of growing a variety of crops, providing a variety of needs, as also allowing biodiversity to flourish and keeping the soil healthy and productive.

The *Beej Bachao Andolan* (Save the Seeds Movement) was later started in the village to work towards recovering seeds that were lost due to the heavy influx of HYV (high-yielding variety) seeds during the Green Revolution. Since the starting of the *Beej Bachao Andolan*, hundreds of varieties of seeds have been recovered. There are a number of *Mahila Mandals* (women groups) that look into farming and biodiversity issues.

While protecting agro-biodiversity, the village simultaneously put systems in place to protect its forests. This has resulted in healthy forests and land, an increase in biodiversity and high underground water tables. This is essential for places like Jardhar where a vast majority of the population is still directly dependent on agriculture and forest produce. The *Beej Bachao Andolan* also focuses on information dissemination on conservation.

The major problems faced by Jardhar are the waning interest of the younger generation in the movement and the threats from destructive development projects like mining. Currently, the village is also trying to stop hybrids and genetically modified (GM) crops from entering their farming systems. They are fearful that the government will propagate GM seeds by selling them at subsidised rates and advertising them as the strongest and highest yielding varieties of seeds,

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much like they did with HYV seeds. The people of Jardhar think that since Uttarakhand is supposed to be an organic state, GM seeds should not be propagated.

Siddappa Setty of the Bangalore-based NGO Ashoka Trust for Research in Ecology and Environment (ATREE), talked about the agricultural and wildlife conservation practices of the Soligas, a tribe in the Biligiri Rangaswamy Temple Wildlife Sanctuary (BRTWLS). The Soligas farm on land and collect non-timber forest produce (NTFP) from within and outside the sanctuary. Prior to 1972 (the year the Wildlife Act was promulgated), wild animals consumed half of the crops that were cultivated by the tribe, which they tolerated, but later as their access to land reduced dramatically due to conservation policies, they could not afford to lose such vast quantities of crops anymore.

Traditional methods of farming are still used to grow a variety of crops and conserve seeds. They previously used shifting cultivation, leaving land fallow for four to five years to let it regenerate before using it again. This method was later prohibited within the BRTWLS, and broadcast sowing methods in settled agriculture were adopted. However, the irregular crop arrangement makes it difficult to remove weeds. To tackle this problem, the sowing patterns were changed from broadcast to in-line. The systematic rows of crop made it easier to locate and remove weeds. However, different problems cropped up with this method and it was discontinued. Farmers on hill slopes and those who did not have cattle to help them cultivate, found this method cumbersome and were the first people to revert to their earlier methods. Farmers also realised that removing the weeds gave wild boars better access to the crops. After four years of experimenting, most of the farmers have returned to broadcast farming. Traditional farming is currently threatened both by the increase in the number of coffee plantations in the area as well as the excessive growth of Lantana in the WLS, which in turn is forcing wild animals to enter the Soliga farms in search of food.

Raman Sukumar of CES and IISc, spoke about human-elephant conflict in agricultural landscapes. According to Sukumar, this is an age-old problem and cannot be completely eradicated, however, one can definitely work towards reducing losses. There should be extensive studies on the extent of damage caused by elephants along with the variety and quantity of food available in the forest, as this information will help unravel the motivational factors behind the instances of crop raiding. After all, elephants take to fields for the same reasons that humans do – limited access to forest produce, and for the nutrition and the taste of farm grown crops.

These studies can be followed by bringing about changes in cropping patterns and enforcing landscape planning to increase the availability of nutritious food for the elephant populations within forests. However, increasing forest cover does not necessarily reduce human-elephant conflict because degraded land often has a higher carrying capacity of elephants than a rich forest. Often more elephants are found in buffer zones than in core areas. This is apparent in Joint Forest Management sites where forests have provided shelter but not food for elephants. Thus, they raid crop from farms nearby and then use the newly regenerated forests to hide. Sukumar also noted that elephants are now travelling to forests where they were not found earlier. He said that although the number of conflicts has reduced over the last 20 years because the male population has decreased, the compassion people had for the animal has also decreased. Thus, communities that traditionally refused to kill elephants even when there were human casualties, are now open to culling animals to prevent farm raids.

Discussion

The presentations were followed by a discussion. One of the main questions revolved around what individuals could do to support these efforts. Jardhari asked people to revaluate their own lifestyles and find out where they could make changes. He suggested small things like terrace gardens, buying locally grown food and organic food if it was possible. He also asked people to reconsider eating industrial meat because the production and transportation of such meat costs a lot in terms of resource consumption.

Some participants questioned the viability of organic farming by stating that it was replaced by Green Revolution in the 1970s because organic farming was incapable of producing sufficient quantities to feed the country. They pointed out that food needs are much higher than they were before and will double or triple in the next few decades and wondered how organic farming would be sustainable now if it wasn't earlier. They asked if perhaps, it was necessary to continue with non-organic methods of farming and add to them by using genetically modified (GM) seeds.

The speakers reminded the audience that the Green Revolution was aggressively pushed onto farmers by heavily subsidising the cost of HYV seeds and fertilisers. However, these prices changed, the quality of the soil decreased and ultimately the production levels dropped, making this form of farming unsustainable. Furthermore, it has led to farmer suicides across the country and these deaths must be accounted for while assessing the sustainability of non-organic methods of farming.

The speakers acknowledged that organic farming also had its drawbacks and said it should be used only when it seemed to be the most sustainable (in terms of economics

and ecology) option. Unfortunately, several farmers have forgotten traditional methods of farming because they have been using the Green Revolution methods for decades. This meant that even though farmers might want to revert back to organic farming they no longer have the means and knowledge to do so.

The speakers feared that pushing GM seeds would have effects similar to that of the Green Revolution. The solution to this was forming networks that could help each other with farming methods and seeds. Linking markets and locally produced food was also the need of the hour. This has been achieved by the Deccan Development Society in Zaheerabad (Andhra Pradesh, India), by linking the public distribution system to a variety of local, organically produced, nutritious crops.

In response to the question about the looming food crisis, the speakers said the solution was not more intensive farming on larger patches of land but farming more essential foodstuffs rather than non-essential cash crops. They also recommended adopting eating habits that are easier to sustain like eating more bajra and unpolished rice. Finally, one would also have to question the social hierarchy of farming methods. For instance, dry land farming is viewed as inferior to water intensive irrigated methods even if it is more effective under certain conditions. If such false hierarchies were done away with, appropriate methods would be adopted to suit particular land types and farming would be more effective. Working on these structures takes time and energy. In Zaheerabad, it took fifteen years to prove that dry land farming was the more effective method.

The session ended with a discussion on GM seeds. A comparison was drawn between growing monocultures of GM seeds and using traditional organic forms of agro-biodiversity. People argued that if a farm has a rich diversity of crops, this diversity acts as a buffer. If a particular crop gets infected and dies, there will still be other crops that assure the farmer of some food and sustenance. This was not the case with monocultures of hybrid, HYV, or GM crops as the produce of a whole farm would be wiped out if an infection or a disease attacked the crop. The discussion veered to the ethical arguments for and against GM, and naturally available seeds. People were divided on whether they were more comfortable with one or the other kind of seeds. Participants agreed that there was insufficient scientific data to prove whether one form of farming was better than the other due to a paucity of examples of direct comparisons between the two forms. However, observations from the various examples of organic, sustainable, biodiverse farming suggested that such alternatives could be viable in the long run for India, and provide appropriate resolutions for the conflicts between agriculture and biodiversity conservation.

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COMMUNITY-BASED CONSERVATION

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Ashish Kothari of Kalpavriksh, Pune, gave an overview of community-based conservation in India. He specified three areas that needed to be focused on, namely community conserved areas (CCAs), protected areas (PAs) and landscapes outside CCAs and PAs.

CCAs can be roughly defined as natural and modified ecosystems that contain significant biodiversity values, ecological services and cultural values that are voluntarily conserved by indigenous/mobile/local communities through customary laws or other effective means. In most cases these areas have been beneficial for the local ecosystem, the biodiversity, the people and the adjoining areas.

Internationally, several policies have been formed to acknowledge CCAs, like the Convention on Biological Diversity, which has been ratified by India. There are also several Indian laws and policies that could back CCAs or co-managed (CM) areas. The National Wildlife Action Plan talks about CCAs and CMs; Wildlife Protection Act (amended in 2002) brought in concepts like Community Reserves and Conservation Reserves; The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, mentions community forests; the Indian Forests Act, 1927, mentions village forests. However, challenges still exist in the form of appropriate implementation of these laws and policies. Furthermore, destructive development projects and globalisation have led to the watering down of these laws and policies.

While acknowledging the importance of PAs to protect certain species and ecosystems, one must realise that over 3 million people live inside them and the creation of such PAs has led to the displacement and disempowerment of these individuals. This has caused several problems like loss of traditional forms of conservation, clashes with the forest department, illegal poaching and timber extraction, to name a few. This often negatively affects conservation itself, and defeats the purpose for which PAs were created, apart from creating enormous human suffering. But there are some initial changes taking place, such as Periyar Tiger Reserve where officials were working with local adivasi communities to enhance their livelihoods and involve them in protection. In this case too, developments in international policies such as the CBD Programme of Work on Protected Areas, which emphasised collaborative management and the integration of conservation with livelihoods, could lead to more equitable conservation within India.

The landscape approach seeks to connect different areas under conservation and sustainable use, and form extensive stretches of conserved areas rather than little islands of protection. This could include CCAs, PAs and many other forms of conservation sites to form a strong mosaic of conservation.

The overview emphasised the need for participatory methods of conservation that ensured wildlife protection and the rights of local people to life and livelihood.

Kanhaiya Gujjar, a villager from Bhaonta-Kolyala villages working with the NGO Tarun Bharat Sangh in Rajasthan, spoke on community-based landscape conservation in Rajasthan with reference to the River Arvari in Alwar district in Rajasthan. The area had thick forests, but lost them during colonial rule. This trend continued after India became an independent nation and caused many problems like the drying up of the Arvari, severe droughts during dry seasons and excessive soil erosion during the monsoons. In 1987, along with the Tarun Bharat Sangh (TBS), the villagers conducted a meeting to address various local problems. They decided to regenerate their forest and revert to traditional forms of water management to restore the ecological balance of the area. To achieve this, rules about forest use were implemented and traditional water harvesting structures (*johads*) were constructed. Their efforts paid off when the river regenerated and started flowing again. Currently, there are 30 tanks in the area as opposed to the 4 that existed when the movement started.

Several threats have cropped up since the revival of the river. One of the main problems was the fishing contracts leased out by the government to private bodies. The TBS opposed this and won the struggle. They realised the need for their own governing body that would protect the river from such instances in the future. They formed the Arvari Sansad (Parliament). This is the first peoples' parliament in the country. It has 242 elected members and various internal communities that look into matters related to the river (including water sharing, wildlife and forest conservation, inter-village disputes, and others). However, they still face

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various challenges including boundary issues with their neighbours, threats of mining and other development projects, election politics that threatens to fragment their society and insufficient cooperation from government bodies.

Tsilie Sakhrie, an Angami tribal from the Khonoma Tragopan Sanctuary Trust in Nagaland, spoke about community conservation of the Blyth's Tragopan. Khonoma is a village in Kohima district, Nagaland, that is rich in biodiversity and home to the threatened Blyth's Tragopan. Sakhrie and a few others set out to protect this bird and conducted various conservation activities. Since, hunting was traditionally acceptable and glorified in Khonoma, they initially faced a lot of resistance and opposition to their conservation efforts. Through continuous interactions with the community, Sakhrie and his colleagues made people realise the importance of conserving the Blyth's Tragopan and the village moved away from hunting and towards conservation. In 1998, the Khonoma Nature Conservation and Tragopan Sanctuary was officially established. It is managed and supported by the local community.

Vijay Jardhari, a farmer, spoke about community conservation in his village Jardhargaon in Uttarakhand. This village is situated in the Himalayan foothills at an altitude of 1,500 metres. It has 17 settlements with 8-10 families each. The major occupations here are agriculture and animal husbandry. They rely on local forests for firewood, fruits, fuel and medicinal plants. By 1980, deforestation activities conducted by the forest department and local people had left the forests almost bare. Jardhari was a part of the Chipko movement and was aware of the power of peoples' movements. In 1980, the people of Jardhar had a meeting and decided to work towards regenerating their forests. They formulated rules and appointed guards to protect the forests. They formed a *Van Suraksha Samiti* (VSS) or Forest Protection Committee, and appointed a forest guard with their own resources. Within three years, the forest had regenerated substantially; within 30 years it had become dense with high biodiversity.

Having dealt with their forests the villagers also decided to stabilise their farming methods. Chemical fertilisers had affected farming in the area so they reverted to traditional forms of farming. They collected and distributed local seeds and started the *Beej Bachao Andolan* (Save the Seeds Movement). Despite their success they face several problems. There has been a significant increase in human-wildlife conflicts, the community natural resource management enjoys no legal backing, and government policies that promote chemical intensive farming methods are in direct conflict with their traditional methods of farming.

Anil Bhardwaj of Wildlife Institute of India, Dehradun, talked about the ecodevelopment project in Periyar as an example of successful local community involvement in a tiger reserve. In the 1980s and 1990s, Periyar was viewed as a rich forest, but was actually riddled with problems ranging from ganja cultivation and poaching to waste problems caused by tourists and pilgrims. The roots of these problems lay in poor park management and heavy dependence of local people on the forest. Thus, it was decided to pilot an eco-development project to meet the needs of conservation and livelihood. Local people would be involved in protecting the PA and alternate forms of livelihood would be made available for them to offset the losses accrued by changing their traditional methods of using the forests. The project also envisioned converting poachers into protectors, forming women groups and local self-help groups to create a strong base of local people who would support the project with their knowledge of the forest and learn new skills to propel the project further. They worked towards creating several eco-development committees that handled different issues, helped local people get rid of their debts and arranged for them to be involved in conservation and documentation work. Local communities are trained to conduct eco-awareness camps and are part of regularising the pilgrims in the park. Through a slow process that began with creating a relationship based on trust between the local people and forest officials, a working model of joint conservation has been created.

Charudutt Mishra of Nature Conservation Foundation and the Snow Leopard Trust spoke on community-based management of human-wildlife conflict, with special reference to the work going on in Spiti, Ladakh. He spoke about two basic dimensions of the effort – understanding the conflict in the area, and managing it. While undertaking the first part, one must take stock of the situation and understand the perceptions and psyche of the people in the area apart from the actual information on losses. These are extremely important when it comes to actually implementing the management plans. In Spiti, Snow Leopards were highly dependent on livestock in some areas and were responsible for *c.* 12% of the livestock losses. The perceptions of the damage caused by the animal were magnified because of a lack of data (actual losses, causes, circumstances of loss) and because of insufficient and delayed compensation for livestock losses. The best way to deal with human-wildlife conflict, was to address all three of these simultaneously – reducing livestock losses, economic offsetting and increasing the social understanding of the situation. In Spiti, they reduced livestock losses by putting better herding methods in place, and increasing the populations of wild prey of the Snow Leopard. They created community-based insurance which is run by the community and gives complete compensation much faster than the government bodies because of simpler

verification and disbursal procedures (uncovering false claims is easy in a small community). Conducting educational programmes and giving incentives to undertake conservation have increased social understanding. This programme has been running successfully for over five years and livestock losses have reduced dramatically. Mishra pointed out that while it was important to have community-based management plans, there should also be governmental support.

Panel discussion

Madhu Ramnath, an ethnobotanist, talked about the importance of lesser known non-timber forest produce (NTFP). He said that while the most prominently discussed forms of NTFP tend to be profitable ones like Tendu patta (*Diospyros melanoxylon*), sal seeds (*Shorea robusta*) and Mahua (*Madhuca indica*), there exists a rich diversity of non-commercial NTFP that are vital for the health and subsistence of local communities.

The commercially viable forms are used to make a variety of products from cigarettes to alcohol. The collection processes are often highly politicised, involving power struggles between local communities, forest departments, local governments and private bodies. The other forms of NTFP exist in the form of fibres, leaves, poisons, berries, yams, etc. with specialised functions related to health and survival.

With 20% of our population still directly dependent on such produce, one should not undermine the power of these forms of NTFP. Ramnath stated that although commercial NTFP assured local communities some money, the non-commercial ones were far more important because they could ensure good health, food security and sovereignty. They also required and could ensure the maintenance of healthy, biologically diverse forests.

Sharad Lele from the Institute of Social and Economic Change in Bengaluru, spoke on forest-based enterprise and community-based conservation. He enumerated the barriers that impeded the two from interacting effectively. The attitude of those in power is the biggest barrier that prevents local communities from taking part in conservation activities. He pointed out that in all the case studies discussed in the seminar, local communities had to prove their worth as conservationists to external bodies before they were allowed to partake in the process of conservation. Often, when the local communities are involved in conservation processes, they are given menial tasks or ones with lower levels of responsibility. This is indicative of the level of trust extended by external bodies to the community. The right of local people to be intricately involved with wildlife conservation and eco-tourism in their own area should be acknowledged. Ultimately, instrumental approaches to CBC have been used rather than focusing on rights-based approaches. Another problem was the paucity of formal spaces where local communities could legally partake in conservation efforts. This could change with the implementation of the Forests Rights Act because it has potential to acknowledge these rights. Lele also reminded external bodies that it is alright if the fiscal profits expected by local communities from eco-tourism and other profit generating enterprises are lower than what the external bodies expect.

Tushar Dash from Vasundhara in Orissa, spoke about community conservation and the Forest Rights Act. Orissa is a state with 62 tribes where 13 primitive tribal groups are mostly forest dwellers, 44% of the land is scheduled area and over 40% of the people are critically poor and dependent on the forest for livelihood. Thus, it is important to recognise the rights of local people, whose lives have been and continue to be, intricately linked with the forest, while looking into conservation issues. He talked about two forms of conservation: the exclusive approach and the community conservation initiatives (CCI) approach. The former works towards creating conservation enclaves and normally ignores or denies traditional practices, the rights of local people to be involved in conservation processes and their rights to livelihood. The latter is normally based on traditional knowledge and practices that have developed over time and addresses the issues of rights and livelihoods. Traditional forms of CCIs are present all over Orissa. Currently, there are about 12,000 forest protection groups working around two million hectares of forest rich in biodiversity. This includes initiatives in wetlands and coastal areas, and species protection and conservation based on cultural or spiritual beliefs.

These initiatives require legal backing, recognition of rights and protection from development threats. The Forest Rights Act (FRA) has, to some extent, achieved these goals. It has been used in places like Nayagarh where 200 villages have claimed rights over community forests that they have been protecting. In Niyamgiri, the Dongria Kondhs have used FRA to fight a mining project that threatens the area. Section 5 of the Act gives *Gram Sabhas* the right to form conservation and development committees, and Community Biodiversity Management Plans have also been used to increase local participation in conservation processes. Thus, the FRA has the potential to ensure greater involvement of local people in conservation efforts. But the main challenge lies in making more people aware of the act and in implementing it.

Nitin Rai of Ashoka Trust for Research in Ecology and Environment (ATREE), Bengaluru, talked about community conservation in Biligiri Rangaswamy Temple Wildlife Sanctuary of Karnataka. There exist, within the sanctuary, several sacred sites of a tribe called the Soligas.

Most of these sites have not been identified on modern maps. There are five tribes with a total population of 12,000 who live in and around the sanctuary. They have created a cultural map, where 593 sacred spots have been denoted. The Soligas also defined various vegetative classes that were highly specialised, based on information like the contour of slopes, the composition of the area, the density of flora and several other similar pieces of information. This map, with its different vegetative classifications and cultural sites, is a historical and cultural map of the Soligas. They see it as a method of supporting their right to claiming the forest and argue that they can claim the land because they have used the same method employed by urban people to claim land – which is, naming and mapping areas. There are various efforts towards claiming these rights through Section 33b of the Wild Life Protection Act (2003 amendment) and Section 5 of the Forest Rights Act.

General discussion

After the presentations and panel discussion, there was a question-answer session and a discussion. The discussion revolved around the problems of CBC. This included the fallouts, loopholes and unforeseen complications of this method of conservation.

One common problem in most of the successful sites was an increase in human-wildlife conflicts, especially with monkeys, wild boar and nilgai. The discussion brought out a variety of possible solutions ranging from culling and hunting to changing cropping patterns. However, the group acknowledged the difficulties in implementing these methods due to religious/cultural values attributed to the animal in question and due to ethical doubts about the right to cull animals. Other solutions were urgently needed.

Conflicts between generations based on changing values and materialistic desires are also common to these communities. Younger generations often do not wish to actively continue with the traditional paths that the previous generations have created. This problem becomes acute when destructive development projects, that claim to offer employment and salaries, are proposed in these areas. While the youth focus on the money that could be earned through these projects, the older generations focus on the changes in the ecological conditions of the area and social fabric of the community. Kanhaya Gujjar shared his experiences with the group where families did not speak to each other because they differed over a mining project that was coming up in their area. However, when the youth saw the rapid changes in the society that took place because of the influx of foreigners, they realised that the social cost outweighed the monetary benefits and they too fought against the mining project.

Some people wanted more scientific data to prove the effectiveness of CBC. A need for scientists and researchers to conduct studies on the feasibility of these initiatives was identified. These studies could determine factors that have helped or impeded the CBC site and subsequently help with future endeavours.

Part of the discussion revolved around what urban people could do to contribute to CBC initiatives. One method was supporting similar activities in their own areas. An appeal was made to support laws and policies that helped CBC. The FRA was taken as an example of a law that could give people the rights they have long been denied. However, there has been misguided opposition to this act, and lawsuits aimed at nullifying the act because it is viewed as a threat to conservation. Rather than removing the act, people could work towards improving it through amendments and through its implementation, and ensuring that it aids conservation processes.

An important point from the talks that was repeated in the discussion was that the CBC may not work for all ecosystems and people. It is not a panacea for all situations, but one in a larger mosaic of conservation methods.

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