

Discussion - 2  
 From the Field - 3  
 Linkage - 4

# ACTION

A Quarterly Newsletter of Action for Food Production (AFPRO)

## ED's Note

The challenge of food security, especially in the face of rising food prices, places a serious responsibility before the country. Despite immense advances in agriculture sector, many people still sleep hungry or live under threat of food shortage. The degradation of natural resources is also a major concern as it severely impacts the livelihoods of poor and backward communities in rural areas.

World Bank report 'Agriculture for Development' highlighting regional challenges of agriculture sector, mentions that India presently faces a serious problem of depleting ground water that makes agriculture unsustainable and creates risk to environment. Impact of climate change is also being felt in the agriculture sector, making it even more vulnerable. National Mission on Sustainable Agriculture of National Action Plan on Climate Change (NAPCC) aims to make Indian agriculture more resilient to climate change by identifying new varieties of crops, supported by integration of traditional knowledge and systems, information technology and biotechnology, as well as simplified credit and insurance mechanisms to ensure food security in sustainable mode. To address the issue of food security, Government of India is legislating the Food Security Act by reforming the public distribution system. However it also needs to address the need for sustainable agriculture and better management of natural resources for livelihoods.

Knowledge transfer to small and marginal farmers plays key role in sustainable agriculture. With capacity enhancement on natural resource management, right incentives and government support, farm families can make significant progress towards managing their land and water sustainably. It is desirable that the appropriate quantum of credit for ensuring proper security to a crop be ascertained. Agricultural systems need to use new approaches to increase food production while protecting the resources on which they depend.

This issue of newsletter focuses on the need to shift from intensive high-cost input agriculture to sustainable agriculture and adopting better management practices at each stage of crop cycle to minimize cost of production and control environment degradation.

**DK Manavalan**

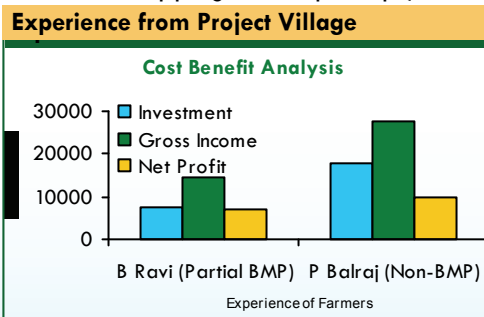
Executive Director, AFPRO

## Better Management Practices in Cotton : A Way to Sustainable Agriculture Practices

- M V Sakhare, Sr. Agricultural Specialist, AFU-I

Sustainable Agriculture refers to the set of practices adopted for cultivation that are least harmful to the environment while ensuring a good crop. It involves crop production methods that support sustainable natural resource management to increase crop productivity, maintain biodiversity, and also are economically viable and socially acceptable. Soil and water management, organic farming, integrated pest management, and integrated nutrient management are common practices promoted under sustainable agriculture.

Farming community in Vidarbha (Maharashtra) and other states have experienced acute distress in the past decade. In view of the vulnerability of cotton farmers in the region an innovative project Better Management Practices (BMP) in cotton is being implemented by AFPRO in Yavatmal District of Maharashtra. BMP in Cotton promotes sustainable agricultural techniques and has a special emphasis on reducing use of chemicals in the cultivation of agricultural commodities. The overall objective of the program is to identify environmentally sustainable and yet economically viable cotton cultivation technique. Some of practices demonstrated under project are in-situ soil and water conservation and protection of irrigation sources, border planting and intercropping of trap crops, bio-fertilizers, scouting,



organic fertilizers, low cost protective irrigation, clean harvesting and storage of cotton. Despite scanty and erratic rainfall with major part

of the farming having been done on light soils, the adoption of BMP has been justified. The cost-benefit analysis authenticates high net return to the farmers practicing BMP even in low rainfall areas. BMP has successfully established a better way towards sustainable agriculture with enhanced profitability.

However, climatic conditions and markets play an important role in deciding the fate of farmers particularly in rainfed agriculture. Hence, there is need for policy initiatives at Government level on marketing, credit and insurance so that farmers can generate surplus net-returns after adopting sustainable agricultural techniques.

Our learnings reveal that, cotton farm practitioners get an understanding on potential and importance of sustainable agriculture practices not only for direct economic interest but also for ecological sustainability. The scope for adaptation of sustainable agricultural practices is wider, but needs continuous support from government and non-government organizations in upgrading knowledge of farmers and developing need-based models.

## Sustainable Agriculture: An approach to reduce burden on the ecosystem

Agriculture continues to be the mainstay of the Indian economy, as it provides food security and livelihood to the larger number of poor communities. Expectations from the non-farm sector in improving socio-economic conditions of this strata of population have not been met to desired levels. Thus, to a great extent, the agriculture sector alone faces responsibility to provide for a great majority of India's poor.

Government has taken several steps to promote agricultural production by subsidizing supportive inputs and simplifying credit facilities. National Rural Employment Generation Act (NREGA) is attempting to enhance livelihood security of people living in rural areas. The Food Security Act being envisaged to address families living below the poverty line focuses on reforms in the public distribution system. However, supply of food items only partially fulfills the broader objective of food security for all. Farm-based livelihoods based on sustainable agricultural practices need to be promoted and protected through policy for poor and marginal farmers to participate in economic growth.

Faced by an increase in global demand for agricultural commodities, over-exploitation of the natural resource base through high cost input and water-intensive technologies makes nature vulnerable regarding its capacity to meet future requirements. Resultant deterioration of soil health, ground and surface water quality, and depleted water table are narrowing the natural resource base. Policy makers need to understand the importance of protecting and managing natural resources for present and future food security.

### What is Sustainable Agriculture?

Sustainable agriculture is the use of such farming systems that enhance the economic viability of agricultural production by proper management and caring of natural resources and ecosystems. This method of agriculture follows the principles of nature and suggests soil and water conservation measures, bio-fertilizer and pest management and proper use of biodiversity.

However, certain myths have been unfairly associated with sustainable agricultural practices, such as lack of modernity and rejection of appropriate technology, as well as yielding less profit from farm activities. Experiences suggest that the practices could be as profitable as modern farming practices with involvement of technologies that are less harmful to the environment.

### Why Sustainable Agriculture?

For decades, agricultural science has focused on boosting production through the development of new technologies. To meet increasing demand for food, people have been resorting to intensive cultivation practices with the use of fertilizers, pesticides, fungicides and other modern input technologies. Use of these inputs has polluted soil, water and environment which later caused slow degradation of soil health resulting

in a decrease in yields. Sustainable agricultural practices provide options that enable rejuvenation of soil and water resources while assuring a strong crop.

### Definition of Sustainable Agriculture and Rural Development by Food and Agriculture Organization (FAO)

- Ensures that the basic nutritional requirements of present & future generations, qualitatively & quantitatively, are met while providing a number of other agricultural products.
- Provides durable employment, sufficient income and decent living and working conditions for all those engaged in agricultural production.
- Maintains and, where possible, enhances the productive capacity of the natural resource base as a whole, and the regenerative capacity of renewable resources, without disrupting the functioning of basic ecological cycles and natural balances, destroying the socio-cultural attributes of rural communities, or causing contamination of the environment, and
- Reduces the vulnerability of the agricultural sector to adverse natural and socio-economic factors and other risks and strengthens self-reliance.

### Key issues to promote Sustainable Agriculture

Promotion of sustainable agriculture has not been an easy task for the government and non-government organizations working on the field. Inadequate knowledge among farm communities and weak supportive infrastructure are proving challenges in promotion of the practices. And, it leads towards poor management of land, water, vegetation, livestock and fisheries resources with indiscriminate use of pesticides and chemical fertilizers.

Preference of cultivating cash crops rather than food crops among the farmers is encouraged by subsidies provided by the government and poses a major challenge in the large scale adoption of sustainable agricultural practices.

Capacity building of community-based organization in the use of eco-friendly agricultural techniques as well as field-based and academic research on suitable working models will promote acceptability of sustainable agriculture as a viable option.

### Conclusion

Sustainable agriculture practices are most suited to reduce the burden on ecology while improving crop productivity. The practices involve low-cost agricultural techniques using available natural resources to either totally replace or reduce the use for pesticides and other ecologically harmful high cost inputs. It is experienced from the field that given an option, small and marginal farmers prefer to adapt sustainable agriculture practices. Large landholders continue to rely heavily on the use of pesticides to earn more from their farming enterprise. Usage of these chemical inputs and high quantities of water that forms common agricultural practice today, has led to severe ecological degradation. Poor soil health & over-exploited ground water resources, & the impacts of climate change, point towards a grave situation. Action from policymakers therefore required to promote sustainable agriculture among farmers.

## AFPRO and Food Security & Livelihood

### Ongoing Projects

#### Ensuring Food Security through Community Participation

The programme "**Ensuring Food Security through Community Participation**", implemented in three different regions in India (Yavatmal in Maharashtra, Rangareddy in AP & Kutch in Gujarat), is seeking to address food and nutrition security at household level. Homestead cultivation, sustainable agricultural and landbased livelihoods, with special emphasis on nutritional intake are the broad components of the food security strategy under the programme. Influencing community level behavioral changes in sanitation, health and hygiene, and promoting maternal & child health are the approach under the health & hygiene strategy. United Way Mumbai, is partnering with AFPRO in this project. AFPRO is working as the main implementing agency for overall coordination and management of the project and extending technical and capacity building sup-

#### Better Management Practices in Cotton

AFPRO initiated the Project "**Better Management Practices (BMP) in Cotton**" to develop community-based models of sustainable cotton production by decreasing the amount of water and pesticides used in cotton production. In collaboration with IKEA, the project has been implemented in Yavatmal district of Maharashtra. Farmers have been motivated and trained on the concept. BMP focuses on low-input environmental friendly approach to cotton cultivation. This is being achieved by developing and implementing appropriate BMP modules; working closely with research centres, target farmers and extension services. The successful result of the BMP interventions in Yavatmal has instilled greater confidence in the potential of sustainable agricultural techniques. From this year the project has been scaled up and is being implemented in two districts of Gujarat.

#### Live Better with the Flood

"**Live Better with the Flood - An Approach for Sustainable Livelihood Security in District Dhemaji, Assam**" is being implemented by AFPRO for one year under the National Agriculture Innovative Project (NAIP) of ICAR, New Delhi. The main thrust of the project is to improve rural livelihood security by introducing integrated farming system (IFS) approach in the flood affected district. The project aims to achieve the objective of improving livelihoods of the rural poor through efficient management of natural resources planned in the backdrop of the flooding season. Further, the project seeks to improve the delivery mechanism through skill enhancement of communities as well as developing an institutional approach for adopting the technology and establishing market linkages. The project promotes location-specific models based on the IFS in common lands for improving farmer's livelihood security.

## Learning on Sustainable Agriculture

### Homestead Garden: A way to Nutritional Security

Indigenous knowledge of local communities regarding environmentally friendly land management has large potential to serve the purpose of their nutritional intake. Integration of homestead vegetation within the lifestyle among poor and marginal households provides food supplements that ensure their nutrient security.

Under the project "Ensuring food security through community participation", the community has been capacitated on developing Homestead gardens in their courtyard. The objective of homestead gardening is to provide vegetables throughout the year, primarily for household consumption and thereby contribute to family nutrition. Surplus vegetables may be sold in the market for additional family income. Women from the project villages came forward and are growing organic vegetables at their door step.

### INM & IPM : Ensuring Improved productivity

Integrated Pest Management (IPM) and Integrated Nutrient Management (INM) are eco-friendly practices that help to maintain crop and soil health without affecting crop productivity. Better Management Practices (BMP) involves similar approaches to manage water resources and nutrients as well as control of pests by using indigenous practices in conjunction with farmers' experiences and research bodies. These prioritize planning of optimum irrigation, application of organic manures, bio-fertilizers and bio-pesticides for obtaining sustainable yields.

BMP in Cotton is being promoted among farm communities of Yavatmal project area. Use of cow dung and urine extract as an organic fertilizer, egg-lemon juice, neem seed kernel extract and other regional specific bio-pesticides, as well as drip irrigation are some examples of practices adopted. The farmers using BMPs have received a higher gross margin on average than conventional farmers due to reduced expenditure of chemical inputs besides contributing significantly to the ecology.

### Integrated Farming: Sustainable Livelihood Management

Integrated farming is a farm-based livelihood system that integrates crop production and livestock & fish rearing in appropriate combinations. This practice is logical development of the current farming system combining traditional approaches with suitable technology. Planning a whole-farm approach through Integrated Farming can achieve sustainable production while generating a profit that cares for the environment.

AFPRO has introduced the concept of promoting livelihoods through Integrated Farming System in flood-affected areas of District Dhemaji, Assam, under the National Agriculture Innovation Project (NAIP). Four different models of integrated farming viz. Rice-fish-vegetable, Livestock-fish-vegetable, Dairy-VermiCompost-Fish-Vegetable and Sericulture-Livestock-Horticulture have been adopted after participatory planning at the community level. Further, a cropping calendar has been adopted that enables communities to organize their farming seasons in relation with the flood season.

## Participatory Action for Livelihood Security

- Dhurbajit Sarma, Unit Manager, ATF-G

Twenty-first century agriculture is facing challenges of food security, food safety and ecological security. Current unsustainable land and water utilization practices coupled with lower levels of productivity pose a technological challenge. This can be tackled through Good Agricultural Practices (GAP), i.e. the application of available knowledge for addressing environmental, economical and social sustainability. Access to food that are grown using eco-friendly practices, conserving and improving the natural resources, and adopting thus far ignored indigenous wisdom, is the way forward.

The National Agricultural Innovation Project (NAIP), which accords high priority to generation and transfer of agricultural technologies and suggests innovation in the technology system, is a remarkable step taken recently. "Live Better with the Flood" partnering with NAIP, is a multi-disciplinary and multi-institutional action research program for livelihood security in Dhemaji District of Assam, and has successfully grounded participatory action research on farming system. The program includes integration and diversification in crop, animal, and fish based interventions with restructured cropping patterns and adoption of a crop calen-

### Experience Sharing

An attempt has been made to establish models of profitable, sustainable and competitive agricultural system through agricultural diversification, along with strong service and input support systems covering credit, insurance and extension. The project has ensured the best use of both good genotypes of crops (rice, pulses, oilseeds, vegetables) and animals (pig, goat, poultry) and their ecological management in order to establish their potential benefit at ground. Use of quality seeds, ensuring soil health through conservation farming, and integrated pest and nutrient management, have been adopted successfully in remote and inaccessible areas like Dhemaji. Enhancement of farmer's capacity on use and conservation of natural resources, promotion of indigenous knowledge on sustainable agriculture practices, and local level community management are some prime issues that have been addressed. The project presents a new line in agricultural research, promoting innovative use of appropriate technology based on location-specific and people-centric models.

### Resource Links

- ⌘ <http://attra.ncat.org>
- ⌘ <http://www.caff.org>
- ⌘ <http://dacnet.nic.in>
- ⌘ <http://www.fao.org>
- ⌘ <http://www.manage.gov.in>
- ⌘ <http://www.mssrf.org>
- ⌘ <http://www.sare.org>
- ⌘ <http://sunsite.unc.edu>
- ⌘ <http://sustainable.org>
- ⌘ <http://www.sustainableagriculture.net>

### Eight Steps to Sustainable Agriculture

1. Conserve Soil
2. Conserve Water
3. Use of Organic manure & Bio fertilizer
4. Use of Bio-pesticide & natural predators
5. Encourage Biodiversity
6. Conserve Energy Resources
7. Control of plant diseases and weeds
8. Reduce Risk by managing natural resources

We invite your comments and suggestion.

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Action For Food production (AFPRO) is a non-governmental, socio-technical development organization that has been working to reduce rural poverty in India since 1966. We provide technical guidance and back-up support to grass-root level NGOs in implementing environmentally sound food production, livelihood generation and related projects. Our core competencies are in land and water management, agriculture, livestock and fisheries, renewable energy and forestry. AFPRO reaches out to poor communities through 6 field units and 3 task forces, strategically located in 9 different states in India.