

## 4. Agriculture, Rural Development and Food Security

From a nation dependent on food imports to feed its population, India today is not only self-sufficient in grain production, but also has a substantial reserve. The progress made in agriculture during the last four decades has been one of the biggest success stories of independent India. Agriculture and allied activities constitute the single largest contributor (almost 33 per cent) to the Gross Domestic Product. About two-thirds of the work force in the country depends on agriculture as a means of livelihood.

Despite these impressive gains, India, at present, finds itself in the midst of a paradoxical situation: On the one hand there are record food grain stocks standing at an all-time high (62 million tonnes against an annual requirement of around 20 million tonnes for ensuring food security), and on the other hand, over 200 million of India's population is underfed, and millions are undernourished. The challenge is to bridge this gap.

In a scenario of shrinking land and depleting water resources, the challenge of the new millennium is to increase biological yields to feed the ever-growing population without destroying the ecological foundation. It is thus important—not to package this challenge as a demand or imposition of society on farmers, for which farmers would bear the cost, but as a necessity and methodology to also sustain their welfare and incomes.

India has the potential to meet these challenges. This potential can be realized through policy and infrastructure support from the government and by strengthening proactive synergies among the various sectors that play influential roles in the field of agriculture and rural development. The National Policy on Agriculture seeks to actualize the vast untapped growth potential of Indian agriculture, strengthen rural infrastructure to support faster agricultural development, promote value addition, accelerate the growth of agro-business, create employment in rural areas, secure a fair standard of living for the farmers and agricultural workers and their families, discourage migration to urban areas and face the challenges arising out of economic liberalization and globalization.

The following are suggestions towards achieving sustainable agriculture, rural development and food security. They provide a reference for actions to be undertaken by the various stakeholders in this area.



## Learnings and Perspectives

### 4.1 Promote Sustainable Agriculture and Rural Development

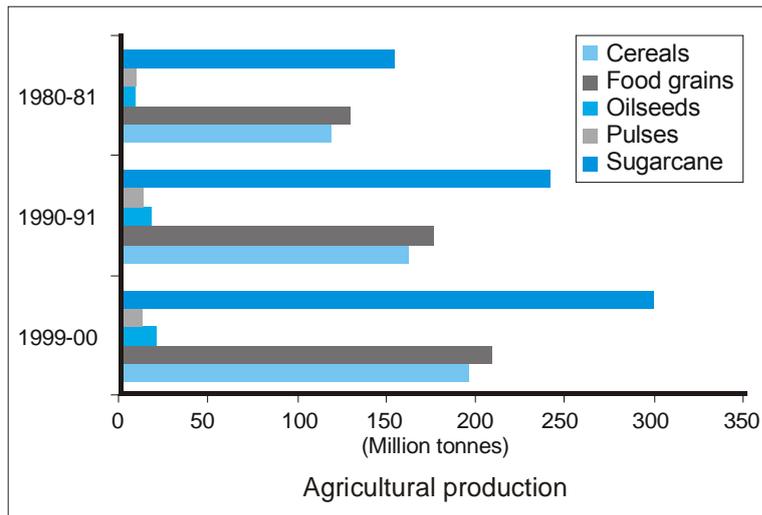
Agriculture is directly linked to very many facets of sustainable development, including poverty eradication, sustainable consumption and production, management of natural resources, energy, freshwater, health, education, trade and market access, as well as technology transfer and capacity building. Agriculture is an integral part of the general development system,

...serving the system as a whole, and being served by it. If the effects of other sections of the development systems reduce sustainability, then sustainability of agriculture is also affected. A sustainable system should be resilient, and able to withstand shocks and failures of parts of its systems without the whole collapsing, and without small shocks leading to a spiral of unsustainability.

Agriculture centres on integrated use of natural resources such as soil, water, climate and biological diversity. The integration of agriculture with other aspects of

land management and ecosystem conservation is essential in order to promote both environmental sustainability and agricultural production.

- Natural resources have to be accessible to the poor, which in the farm sector means secure rights to land, water and genetic resources. For this, there is a need to develop public-private partnerships.
- Policies for land and water resource management, biodiversity protection, infrastructure investment, strategy on institutional market reforms, reduction of tariffs and phasing out of possible commodity control are integral to achieving sustainable agriculture.
- Sustainability should be seen in the context of different agro-climatic zones as well of as the country as a whole. Suitable technologies should be developed and indicators for sustainable agriculture should be identified for both.
- It is essential to provide funding for integrated rural development plans, programmes and strategies, at national and regional levels, with particular emphasis on investment in economic and social infrastructure in rural areas, enterprise development, human resource development, and capacity building for local governance.



- An efficient credit policy regime with the required rural banking and credit system will play a major role in the future. The government should encourage investment in vital agriculture infrastructure, credit linkages, and use of new and appropriate techniques towards this end.
- More than 70 per cent of the country's agriculture is under small and marginal farmers with limited resources. A nationwide crop insurance scheme will provide such farmers the needed confidence to invest and gain from technological advances in agriculture.
- The focus on accelerated food grains production on a sustainable basis and free trade in grains, as well as on rural employment opportunities will lead to faster economic growth and give purchasing power to the people, which in turn would help increase household food security.
- Concerted efforts should be made at national, regional and local levels to pool, distil and evaluate traditional practices, knowledge and wisdom and to harness them for sustainable agricultural growth.
- It should be recognized that information is a critical input for agricultural development. It is as important as other key inputs including credit, seeds, nutrients and water. Information can be efficiently converted into economically rewarding opportunities.
- It is critical to recognize that the challenge to world agriculture is both technological (requiring the development of new, high productivity, environmentally sustainable production systems), and political (requiring policies that do not discriminate against rural areas in general, and agriculture in particular).

## 4.2 Promote Equitable Distribution and Access

A positive right to life would imply that the State provides to each and every person, adequate food and other basic necessities, and that it ensures a healthy environment, so that people may live and grow in dignity. The most important challenge in the 1980s and 1990s was physical access to food. In this millennium, the challenge is economic and ecological access to food.

- A transition from chemical and machinery-intensive technologies to ecological farming technologies is required towards providing sustained physical access to food.
- Environmental access involves on the one hand, attention to soil health care, water harvesting and management, conservation of forests and biodiversity, and on the other hand to sanitation, environmental hygiene, primary health care and primary education.
- Emphasis on economic access underlines the need for promoting sustainable livelihoods through multiple income-earning opportunities.
- It is important to increase food availability in areas where it is produced, thus reducing transport costs and excessive dependence on international markets.

- Shift from existing expensive, inefficient and ineffective institutional arrangements, to decentralized management systems of food storage and distribution will improve delivery, reduce handling and transport costs, and reduce corruption, thereby bringing down the issue price substantially.
- Procurement of grain can be decentralized through creation of food grain banks in each village/block of the district, from where people can get subsidized foodgrains (including locally grown coarse cereals) through food coupons.

### 4.3 Secure Food Security for All

Food security is a physical, environmental, economic and social issue. It involves not just production, but access; not just output but process; not just technology but policy; not just global balance but also national conditions; not just national figures but household realities; not just rural but urban consumption; and not just quantity of food but also quality.

- The concept of food security should be broadened to make it holistic so as to mean “every individual has the physical, economic and environmental access to a balanced diet that includes the necessary macro and micro nutrients and safe drinking water, sanitation, environmental hygiene, primary health care and education so as to lead a healthy and productive life.”
- Issues of food security are part of a bigger whole. Sustainable land and water management must be seen as directly linked to food security.

Population growth, environmental sustainability, poverty reduction, agricultural production, distribution, marketing, credit and many other factors also need to be recognized as part of this whole.

- The major challenge is to produce additional food while conserving depleting natural resources. It is also to provide physical, economic and ecological access to food and nutrition security at the household level.

- Food security must focus on a diversified food basket, not food grains alone. Broad-based food security systems are not dependent on two-three species but on over 100 species that are underutilized. This will also prevent locally adapted grains from becoming extinct.

- Nutrition security must be given integrated attention by emphasizing horticulture, animal husbandry, fishery, millets, pulses and several other resources for which India is traditionally known. There is need for investment in science and technology that will promote diversification.

- Food security must not be based on market, but rather on self-reliance



and sufficiency. The approach should be one of moving from food security to food sovereignty.

- The elimination of hunger and malnutrition is not just a food problem. It is linked to poverty and population growth. Rising food output is essential but so are the slowing of population growth and maintaining the ecological balance.
- Food banks at grass root levels should be well maintained.

#### 4.4 Strengthen Extension and Capacity Building Mechanisms

In the 21<sup>st</sup> century, it is increasingly necessary, and increasingly feasible to take a whole systems approach to organized, positive change in rural places. For extension, that means helping farming people toward sustainably increasing productivity—particularly in the small-mixed farming systems in rain-fed areas, in upland areas, and in other places which have been neglected. It also demands measuring success in terms of the consumption of rural people, as well as of their production. And that, in turn, will require agricultural extension systems which help farm men and women organize themselves in ways which empower them—to lead agricultural extension and to exert enough power and influence over agricultural research systems so that they generate useful, practical information which fits the needs and interests of those farming people.

- Agricultural extension must focus on increasing production and productivity of food and fiber in an economically and environmentally sustainable way. It must be done in a way which does not destroy rural livelihoods and rural communities.
- Extension activities should promote more comprehensive rural education and extension programmes directed particularly at rural poor, with major emphasis on efforts to reduce illiteracy, particularly among women and girls.
- It is important to organize education, extension and information, and skill empowerment on the basis of intensification, diversification and value addition of farming systems.
- Partnerships aimed at strengthening the knowledge base, and improving the dissemination of information, such as farm-to-farm technical assistance programmes, can help strengthen agri-extension. Public-private partnerships could be envisaged in basic sustainable agricultural techniques.
- Sustainable agriculture demonstration plots should be set up in research stations, demonstration centres, seed production centers, farmers' training centres etc., of government, cooperative and non-government agencies.
- The system should support a new agricultural extension system that could meet the needs of information-hungry farmers, especially educated youth and women engaged in farming, and would empower them with new techniques and skills that foster sustainable agriculture.

**“What we need is food sovereignty. We reject food security based on the market. Rather, it should be based on self-reliance and sufficiency.”**

Vinod Raina  
Multi-stakeholder  
Consultation

#### 4.5 Promote Awareness and Education Activities

National policies and planning should recognize that public awareness can play an important role in establishing a firm basis for sustainable agricultural resource conservation and use. Public awareness should be considered in the development of all national programme activities.

- National strategies should identify objectives and strategies for public awareness, define target audiences, partners and tools for public outreach.
- Governments should recognize and encourage the work of NGOs in raising public awareness.
- Short-term and long-term courses specializing in sustainable agriculture should be run in agricultural universities. A separate curriculum for this subject should be developed for the regular graduate and postgraduate courses also.
- There is generally public apprehension about the possible consequences of agricultural biotechnology. It is important to organize public information programmes and public discussions that would help share relevant work of agricultural and biological scientists with the public.

#### 4.6 Ensure Appropriate Application of Research, Science and Technology

Scientific and technological development is not enough in itself. It is critical to make sure that sustainability and poverty reduction remain the guiding principles, and that we use our resources, harness our intellect, and direct our knowledge to benefit the poor, the hungry and the marginalized.



- The impact of agricultural research is decisive. Such research should, wherever possible, be coupled with on-farm activities in order that the context and purpose of the work are fully appreciated. Research should assist in the monitoring, evaluation, and improvement of on-farm efforts.

- Research should be undertaken in a participatory and collaborative manner to foster interaction and cooperation between rural people and research institutions. Other institutions must be involved

appropriately whenever necessary.

- A comprehensive area-specific database of natural resources should be developed and made available for agriculture planning, implementation, research and extension. Existing data and information should be assembled, verified, and put in a usable and easily accessible form.

- Well-designed information technology packages should be developed, that could help serve as a market information network; weather, pest and disease

monitoring system; and could be a storehouse of various current farming technologies and practices.

- Modern information technology should be used to reach the unreached. Educated youth must be attracted to and retained in farming through spreading science-based precision farming techniques, which are intellectually stimulating and economically rewarding.
- Training and capacity building should be undertaken in areas such as taxonomy, population biology, ethnobotany, and eco-regional and agro-ecological surveying. Specific research priorities need to be determined separately for each region.
- Additional research is necessary to develop drought tolerant, pest and disease-resistant crops, biological pest management, nitrogen fixation, more effective use of locally available organic materials, inter-cropping systems, and perennial crops, including agroforestry.
- Farming systems need to be designed so as to achieve the triple goals of more food, more income and more livelihoods per hectare of land. For this, it would be fruitful to harness the tools of eco-technologies resulting from a blend of traditional knowledge with frontier technologies. Such tools include biotechnology, information and communication technology, GIS mapping, space technology, renewable energy technologies (solar, wind, biomass, biogas), and management and marketing technologies.
- The revolution in biotechnology has both promises and problems. Biotechnology should be judiciously used so as to support the mission of environmental protection, poverty reduction and food security. But the adoption of every new technology must be accompanied by a precautionary package. In the case of biotechnology, biosafety and biosurveillance must be considered as important factors.
- Food should originate from efficient and environmentally benign production technologies that conserve and enhance the natural resource base of crop and animal husbandry, forestry, inland and marine fisheries.

#### 4.7 Recognizing the Value of Agricultural Biodiversity

While a small number of species provides a large proportion of global food needs, hundreds of other species are utilized at a local level, either through cultivation or harvesting. These under-utilized species contribute substantially to household food and livelihood security. They are often managed or harvested by women. Knowledge concerning the uses and management of these species is likewise often localized and specialized. Many under-utilized plants have potential for more widespread use, and their promotion could contribute to food security, agricultural diversification, and income generation, particularly in areas where the cultivation of major crops is economically marginal.

- It is vital to recognize the intrinsic value of biological diversity and of its ecological, social, economic, scientific, educational, cultural, and aesthetic

**“Women employment and income generation must be given focus to solve the problem of household food security. Involvement of farmers in technological development will help in increasing food production.”**

S. Bisaliah  
Multi-stakeholder  
Consultation

importance. This diversity is being lost in the fields and other ecosystems of virtually all countries.

- High priority needs to be given to safeguarding as much existing unique and valuable diversity as possible in *ex-situ* collections of plant genetic resources for food and agriculture, and also through *in-situ* conservation in their natural habitats.
- Goal-oriented, economically efficient and sustainable system of *in-situ* and *ex-situ* conservation needs to be developed.
- Cooperation among national programmes and international institutions to sustain *in-situ* and *ex-situ* conservation efforts needs to be developed and strengthened. It must be recognized that states have sovereign rights over their own plant and animal genetic resources for food and agriculture.
- A time-bound programme to list, catalogue and classify the country's vast agro-biodiversity with special focus on conserving indigenous breeds and species, must be initiated.
- Agriculture diversity registers should be formed for local and regional varieties. Agriculture policies should be formulated based on these registers.

#### 4.8 Relook at Agriculture and Related Policies

It is critical to develop and strengthen appropriate policies and legislative measures to create an enabling environment for sustainable agriculture and rural development. Such an environment would promote access by the poor to land, water resources and other agricultural inputs; land tenure modifications that recognize and protect indigenous and common property resource management systems, and also build local capacities for better management of natural resources.

- Governments should consider, and as appropriate, adopt policies in extension, training, pricing, input distribution, infrastructure development, credit and taxation, which serve as incentives for crop diversification and the creation of markets for biodiverse food crops, including standards for labeling of foods, which allow the highlighting of use of non-standard crop varieties.
- Policies should stress on land reforms, input and output pricing, investments in irrigation, infrastructure and insurance, legislation for biodiversity, geographic appellation, varietal protection and farmers' rights.
- Well-defined and enforceable land rights, legal security of tenure and equal access to land, water and other natural and biological resources, need to be assured, in particular for indigenous communities, women and disadvantaged people living in poverty.
- It must be recognized that states have sovereign rights over their plant genetic resources for food and agriculture, while also confirming our common and individual responsibilities in respect of these resources.
- Coordination is needed to provide national programmes with information on these issues and to assess the impact of international developments in

these fields on the conservation and exchange of plant genetic resources, and to incorporate new research developments, as appropriate, into national systems and practices.

- Effective regulatory mechanisms and safeguards need to be universally installed so that the impacts of biotechnologies are both productive and benign.
- Development of agro-ecology-relevant technologies based on an understanding of local agriculture and resource management practices need to be supported and promoted.
- Chemicals and pesticides banned in developed countries should not be dumped into developing countries in the name of liberalization, globalization and industrialization.
- When patenting a variety or item of research, the area of origin should get due credit and benefit of the patent.
- Before releasing a new variety, including genetically modified varieties in the market, the following parameters should be considered for a variety of agro-climatic zones: Impact on soil productivity; hazardous residual effect; health hazards; adverse effects on other crops; adverse effects on other agricultural practices; threat to the indigenous varieties; impact on other professions; and impact on flora and fauna.

#### 4.9 Create Favourable Economic Climate

Agriculture has become a relatively unrewarding profession due to generally unfavourable price regimes and low value addition, causing abandoning of farming and increasing migration from rural areas. The situation is likely to be exacerbated further in the wake of integration of agricultural trade into the global system, unless immediate corrective measures are taken. A favourable economic environment and supportive public management system are the key pillars for the promotion of sustainable agriculture.

- Capital inadequacy, lack of infrastructural support and demand side constraints such as controls on movement, storage and sale of agricultural products, etc. affect the economic viability of agriculture sector. These issues need urgent attention.
- Increasing capital formation and farmer's own investments by removal of distortions in the incentive regime for agriculture, improving the terms of trade with manufacturing sectors and bringing about external and domestic market reforms, backed by rationalization of domestic tax structure, will help to create a favourable economic environment for agriculture.
- Agriculture-dependent countries like India should have a certain degree of autonomy and flexibility in determining the domestic agricultural policies so as to improve productivity, enhance income levels, reduce vulnerability to market fluctuations, ensuring stability of prices, etc.
- Creating a level playing field in the global marketplace will provide the

*Agriculture must help produce not only more food, but also more income and livelihood opportunities.*

M S Swaminathan

necessary incentives and leeway for farmers, especially the small ones to adopt environmentally friendly farming practices, and help in avoiding, their desperate acts of survival at the expense of sustainable development, due to distortions in international trade.

- In the context of globalization of the food market, farmers in developing countries need to improve access to their own local markets. A 'market-plus' rather than a pure market approach for the agricultural sector would be effective in addressing the wide range of issues associated with production, pricing, food distribution and access.
- At international forums, developing countries like India should have the necessary flexibility to pursue legitimate non-trade concerns with regard to international markets. Such countries should seek reforms in global agricultural policies relating to price, subsidies, trade and technology transfer, and respect for IPRs of local communities.
- International agreements should allow room for the domestic agricultural sector to meet challenges of maintaining the livelihood of the large agriculture-dependent population, and production of sufficient food to meet domestic needs.



- Agricultural food processing industries with international health standards should be promoted locally.
- Biomass based entrepreneurship should be promoted to generate wealth at the rural level.
- Civil society groups should use benchmarks and sustainability indicators to monitor performance of food processors, retailers and food service companies, especially regarding fair terms of trade.

#### 4.10 Ensure Participation at All Levels, and Protection of Rights

National programmes are increasingly confronted with policy, legal and institutional issues related to ownership, intellectual property rights, exchange, transfer and trade in agricultural resources. Participatory processes and involvement of various stakeholders can help find answers to such concerns. Towards this it is crucial to develop a framework for a unified national programme to enhance the diverse efforts within the country to tackle such issues.

- Programmes and policies for food and agriculture activities should involve public and private institutions and companies, non-governmental organizations, communities and individuals from the agriculture, environment and development sectors.
- The role of indigenous and local communities in conserving, collecting, improving and sustainably using plant genetic resources for food and

agriculture must be acknowledged. Local, community-level initiatives and participation in proposing programmes need to be encouraged.

- Gender concerns in agriculture need to be mainstreamed. Appropriate structural, functional and institutional measures to empower women and build their capabilities and improve their access to inputs, technologies and other farming resources need to be strengthened.
- The need for equitable sharing of benefits arising from the use of traditional knowledge, innovations and practices relevant to the use and conservation of plant genetic resources for food and agriculture must be recognized.
- Nutrition security must be placed high on the agenda for development plans and programmes at all levels—village, block, district and state. Institutions that will design and monitor locality-specific interventions must be developed.



***Bearer of all things, hoard of treasures rare, sustaining  
Mother Earth, the golden breasted...Impart to us those  
vitalizing forces that come O Earth, from deep within  
your body. Whatever I dig up of you, O Earth may you of  
that quick replenishment.***