Indian Agriculture - Tasks For The Eightees

By

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1. THE GOAL

During the 60's and 70's the major goal of agricultural research and development was to assist the country in ridding itself of its dependence on food imports. We had to get away in the seventies from the "ship to mouth" existence through which we had to go through in the 60's. Fortunately due to a series of steps in technology development, organisation of relevant services and above all appropriate public policy support in pricing and marketing, it has been possible to achieve a measure of self reliance in foodgrain supply at current levels of purchasing power. Through complementary programmes such as 'Food for Work' and 'Food for Nutrition', the first steps have been taken to achieve the freedom from hunger goal proposed by India and other countries at the World to Food Conference of 1974, viz., that by 1984 no one should go to bed hungry. Progress has been achieved in improving production not only in wheat and rice but in several other crops, such as potato, cotton, apple, etc. The National Food Security System is slowly taking shape. Consequently, the country could face one of the worst droughts of this century during 1979 without food imports. The question hence arises as to what should be our major goals in the agricultural sector during the 80's. The programmes to be introduced during 1980 - 85 will naturally depend upon an answer to the question.

In my view, the only immediately feasible method of achieving the triple goals of more food, jobs and income in the rural sector is accelerated agricultural and rural devolopment. *I would include in agricultural development, all measures which are designed to improve production, conservation, consumption and trade (both internal and external).* Such a balanced growth of agriculture would alone help to ensure that hunger does not prevail in the midst of abundant food availability. Also, there could be a greater flow of financial resources to the rural sector only by increasing trade in farm goods as well as in agro-based and allied industrial products. By organising such trade on producer-oriented lines, we can ensure that the profits of production go to farmers and the rural population.

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Internationally it is widely agreed that one commodity which will be in the greatest demand by the end of this decade is foodgrain. People can go to some extent without oil but not without food. It is hence likely that by the end of this decade an equilibrium may develop between the price of a barrel of oil and a bushel of grain. Calculations by the Planning Commission show that even with a 7 per cent growth rate in industry, over 75% of the work force will have to be employed in the farm sector as well as in the unorganised non-farm sector. Also, several studies have indicated that agriculture exercises a reasonably strong independent influence on the growth of industry. The impact of agricultural performance is felt both on the output of consumption goods industries and on the output of basic and capital goods industries. *Therefore, in the 80's the major aim of our agricultural strategy should be the development of our agricultural strength in such a manner that we are able to ensure freedom from hunger to our own people and to enter in the international grain and agricultural trade in substantial manner.* It should be our aim to develop the capacity to export at least 10 million tonnes of various foodgrains annually by 1990. Concurrently, steps should be taken to do away with the necessity for importing edible oil. It is only by becoming an important agricultural country in the sense of commerce and trade that we can hope to solve the numerous problems of rural unemployment and underemployment. Also, this is the only way by which our economic and consequently political independence can be maintained. If we do not give an orientation to farming which will provide to small and marginal farmers and share croppers assured and remunerative marketing opportunities, there will be stagnation in productivity and the desired minimum growth rate of 4% will not be achieved. We may then have to import food to feed our fast-growing population.

2. THE PATHWAY

The pathway of agricultural advance we have so far chosen has relied predominantly on individual initiative supported by Government assistance in the supply of inputs, credit and marketing. *The average size of a farm holding, however, is tending to get smaller and smaller. The productivity levels of most of our farming systems are low and consequently the cost of production is high.* The return from the investment on irrigation is inadequate and in several areas such as the Tawa Cammand Area, water is being viewed as a 'curse' by many farmers than the 'blessing' it was intended to be. *The lack of a systems approach in planning and programme implementation has created numerous problems, including a mismatch between production and post - harvest technologies.* Even a small increase or decrease in production hence leads to either an acute scarcity or an uncomfortable glut. This is particularly evident in perishable commodities like onion and potato. *The more easy pathway of agricultural advance we have so far taken will not help us to achieve the goal of becoming a commercially important agricultural country.* We need, therefore, to look at the problems facing our agriculture critically in the light of past experience and current and future needs.

Unless we can maximise the opportunities for intensive agriculture which a small farm provides and minimise the handicaps from which a smaller farmer suffers, we will not be able to capitalise on our agricultural assets. In this context, it is desirable to review the current definition of small and marginal farmers and develop a single term for all farmers who are either economically or ecologically handicapped. Programmes for tnem should cover the entire country and not merely a proportion of blocks Only in this way, our vast human resource can participate fully in development. I would now like to refer to some of the major components of agricultural programmes.

A. AGRICULTURAL RESEARCH

The following are some of the immediate tasks:-

1. Basic Research

a) Raising the ceiling to experimental yield :-

1. Development of genotypes of crops, farm animals and fish suitable for high yield management.
2. Development of *high yield cum-high stability systems of production* in all major crops, farm animal and inland and marine fisheries.
3. Maximisation of benefits from units of soil, water, air space and sunlight.

b) Bio-energetics :-

1. Efficiency of conversion of different forms of 'cultural' energy into food energy.
2. Total biomass production per unit of time, solar energy and cultural energy and partitioning of the biomass into economically benefical pathways.

2. Applied Research

a) Ecology of cultivation :-

1. 'Soil breeding' and soil health care involving suitable blends of ameliorative measures for improviug productivity in marginal soils and low-yield environments.
2. Environmental impact studies of production and processing systems both in agriculture and acquaculture.

b) Energy Management :-

Improved fertilizer and water use efficiency including the development of neem or NR - coated urea and other fertilizers suitable for high rainfall conditions; introduction of decentralised, small, total energy packages for agricultural and other rural applications.

c) Economics :-

Diversified and assured income in major farming systems through mixed farming and 'minimum yield guarantee' programmes; studies on costs, returns and risks.

d) Employment :-

Relevant mechanisation based on the dynamics of labour availability and costs and the development of intensive, high value technology on the lines of hybrid cotton methodology.

3. Adaptive Research

a) Size - neutrality of technology :-

Experiments designed to demonstrate that the technology is size neutral with regard to the size of a farm holding the risk-taking capacity of farmers

b) Identification of the constraints causing the gap between potential and actual farm yields even at current levels of technology :-

Inter-disciplinary constraints analysis under different conditions of farm holdings and management to identify the precise set of factors (e. g. econological, technological, socio - economic and insitutional) responsible for the prevailing gap between potential and actual farm yields under small farmer conditions and getting this data fed into the field extension programmes; priority in such studies may be given to eastern India, where the untapped production reservoir is very high (i. e . in Bihar, Orissa, West Bengal, Assam, N. E. Region and Eastern U. P. and Madhya Pradesh).

4. Extension Education

Enlarge the net - work of Krishi Vigyan Kendras and operational research projects and organise National Communication and Training Centres in pulses and oilseed crops and in post-harvest technology on the lines of the National Communication and Training Centre in Rice at Hyderabad. The "Lab to Land" programme should be made an effective instrument of rapid technology transfer.

To sum up, three arms of the research strategy should aim at

a) reducing the gap between potential and actual *experimental yields* through relevant basic and applied research in all major farming systems;

b) reducing the gap between potential and actual *farm yields* through appropriate packages of technology, services and public policies and

c) efficient energy and input management and ensuring the renewable nature of agricultural wealth through appropriate steps in ecological security

Most of the above mentioned studies will involve inter-disciplinary and in some instances (e.g small farmers' problems) inter-organisational 'symphonies' and hence their success will depend upon the 'genes for co-operation' prevailing in the members of the scientific teams.

The research programmes of ICAR and Agricultural Universities during the Sixth Plan period should aim at consolidation, co-ordination and selectivity. Among the high priority areas for selective research will be the improvement of the yield potential of pulses, oilseeds and sugarcane and of dry farming areas. Similarly, forestry research needs greater attention with particular reference to energy plantations and industrial raw material. There is need for an All - India Co-ordinated Research Project for developing technologies which can help landless labour families to derive supplementary income from animal husbandry, fisheries and agro - industries

B. AGRICULTURAL DEVELOPMENT

In the area of development, more attention will have to be paid *to the organisation of relevant area - based services which will enable all farmers irrespective of the size of their holding and their innate input mobilising potential and risk taking capacity to derive full economic benefit from new technology* The agro - service centres operated by self-employed rural youth will have to be revived and made effective. Brain - brawn - integration can be achieved by bringing together ongoing efforts in Agro - Service Centres, T. V. extension system, Rural Godowns, TRYSEM, district credit plan, etc. An area approach to water management, pest control and post-harvest technology will have to be fostered. *This would require as much attention to institutional arrangements for promoting group endeavour as to making arrangements for giving subsidy and other assistance to individual farmers.*

Along with steps for more efficient water. energy and nutrient management, pest control and post-harvest technology, it is essential that the efficiency of coordinated knowledge transfer and input supply systems is enhanced The T & V system will have to be closely integrated with input - supply arrangements. Particular stress should be laid on *farm management* and for this purpose extension services need considerable strengthening.

Input production : Water, seed, fertilizer, energy and appropriate farm machinery are some of the principal inputs in scientific farming. Investment in all these sectors should be of an order which would help us to achieve the desired output levels. The National Water Plan currently under development will include the following 3 major components :-

a) tapping our full surface and ground water potential of a gross irrigated area of about 113.0 million hectares by 2000 A.D (58.5 million hectares from major and medium schemes, 15.2 m. hectares from minor surface water schemes and 39.4 million. hectares from ground water schemes).

b) bringing another 30 million hectares under irrigation through inter-basin inter-State transfer of river water within our political control by 2000 A. D. and making a beginning immediately with Peninsular Rivers development.

c) stepping up R & D efforts in solar desalination of sea water with a view to providing additional irrigation to the rain - shadow areas along the coast.

We should push ahead in a dynamic manner both with steps for implementing the National Water Plan and for deriving maximum production from the already created water resources through better on-farm management of water. Eastern India, particluarly Assam, North-Eastern Region, West Bengal, Orissa, Bihar and Eastern U. P. will have to receive the maximum attention in ground water utilisation. In rainfed areas, community water harvesting, life-saving irrigation and more efficient delivery systems like drip irrigation will have to be promoted in a big way. Anticipatory research on scientific water use should be carried out in new irrigation project areas so

that problems such as those experienced in Chambal and Tawa Command areas do not recur.

Credit : As we gradually reduce/ eliminate subsidies, the timely and adequate availability of credit becomes vital for ensuring the size - neutrality of economic benefits from new technology; credit planning, distribution and recovery hence needs detailed attention. Effective credit insurance systems should also be developed for sefeguarding farmers from ruin due to reasons beyond their control.

Nutrients : The fertilizer production capacity will have to be tailored to the desired level of farm output. In addition to chemical fertilizers a massive drive for harnessing of organic and biological sources of nitrogen will have to be launched. Phosphorous management and re-cycling will have to receive particular attention since phosphorous is a non - renewable resource.

Seed : The seed production chain should be strengthened and the production of seeds of improved varieties of pulses and oil seeds as well as disease-free planting meterial of sugarcane and horticultural crops should be vastly expanded.

Land Use Planning : More rational and scientific land use practices based on considerations of ecology, energy, economics and employments will have to be promoted. The recommendations of the National Flood Commision will have to be implemented. In all hill areas, the major aim should be to promote land use patterns which are ecologically sound and which at the same time involve the cultivation of low volume/weight - cum - high value crops. Agro-forestry and horticulture will have to receive more attention, particularly in the form of integrated production-processing-marketing system.

Post - harvest Conservation : This is an area where on-going programmes such as 'Save Grain' 'Rodent Control', 'Rural Godowns' etc. will have to be developed into an integrated programme of drying, processing, storage, transport and marketing. An integrated post harvest technology programme which will match the production efforts in both the quantitative and qualitative demensions will have to be formulated. The various links in the producer - consumer chain will have to be strengthened according to the conditions prevailing in each area. Arresting the spoilage of perishable commodities will have to be accorded priority attension. Design of economically viable transport systems is essential particularly in N-E. India.

Horticulture and Plantation Crops : The Sixth Plan should be given a horticultural and plantation crop orientation in arid, semi-arid and hill areas. Fruit trees, vegetables, flowers and plantation crops can help to improve rural incomes.

Trade : This is an area where a considerable step-up of on-going efforts is called for. Producer - oriented trade and consumer - oriented marketing will have to be developed in a mutually reinforcing manner. The opportunities for external trade should be continuously monitored and steps taken to trade the transport arrangements. Suitable steps will have to be taken to instal the requisite handling facilities at ports for loading agricultural commodities for

export purposes. Stability of supply, quality of produce and cost-comparativeness will determine our ability to enter the international agricultural trade in a big way.

Forestry : The role of forestry in meeting our timber, fuel, fodder and industrial needs can hardly be overemphasized. This is an area where there is need for more efforts in stimulating people's involvement. The restoration of the Himalayan and mountain eco-systems will need urgent attention. There is need for an Intensive Forestry District Programme on the lines indicated in the enclosed note.

Fisheries : Organisation of a National Fisheries Survey and the promotion of relevant technology of production, processing and marketing both with reference to inland fisheries and marine fisheries will have to be attended to immediately. Thriving coastal communities of small fishermen and landless labour families based upon an integrated sea farming approach (i. e. an appropriate blend of culture and capture fisheries) and the cultivation of casuarina, cashewnut and coconut along the coast will have to be promoted. Public policy issues relating to E. E. Z. utilisation should be settled without further delay, since with the 200 mile exclusive economic zone, the surface available to India for use is about 60% of the soil surface in the country.

Animal Husbandry : The recommendation of N. C. A. in the animal husbandry sector need to be implemented without further delay. Animal husbandry programmes in dry farming areas and in hill areas need special attention. Integrated systems of genetic improvement, better health care, improved nutrition and producer - oriented marketing will have to be promoted in all the blocks in the country. The special farm animals of the North-Eastern region like the yak and mithun need urgent attention if they are to be saved from extinction. The energy requirements for fodder and feed production will have to be met largely by integrating organic recycling and agro-forestry programmes with animal production programmes.

International Trade : Our entire capacity of monitoring international trends in agricultural trade will have to be greatly improved. Ad-hoc arrangements in the export and import of agricultural commodities should give way to planned and nationally relevant thrusts.

Insurance : Crop, animal and fisheries insurance systems will have to be improved and dovetailed with risk-minimising technology.

Agro-meteorology and Contingency Plans : There is need for stabilising food production through the introduction of appropriate contingency plans based on different weather probabilities. Contingency land and water use planning in drought and flood-prone areas and the building up of sufficient seed and fertilizer reserves will have to become a part of the regular planning process. Agro-meteorology and climate impact studies need greater support. Crop-Weather-Watch groups will have to be developed at the district level for providing early warning and timely action services. *Diara* (riverine) lands need particular attention in view of their great production potential in the flood free season.

Agricultural Statistics : The present position in crop production estimates is far from satisfactory. we need

to enhance our capability in this area very considerably. We cannot take decisions of importance to the lives of about 17% of the human race based on 'impressions' and 'guesses'. The entire area of yield and production estimates in crops, farm animals, fisheries and forestry will have to be carefully reviewed and steps taken to ensure the availability of reliable and timely data. The Agricultural Census operations need whole time guidance and supervision.

Remedying regional imbalances : The Agricultural Plan for 1980-85 should mark the beginning of a dynamic programme of improving the production and productivity of

a) neglected and agriculturally backward areas,

b) rainfed areas; and

c) crops of national importance such as pulses, oilseeds, sugarcane, horticultural crops, etc. in addition to cereals and millets and

d) systems approach to farming involving crop-livestock integration and combined agriculture-aquaculture, agriculture - sylviculture and other combined land and water management systems.

Since all this has to be achieved through small farmers and fishermen, our aim should be to assist farmers and fishermen in all the blocks of the country and not restrict programmes tailored to the need of specific target groups only to some selected blocks.

III. INTERNATIONAL CO-OPERATION

More detailed thought needs to be given to :

a) Technical co-operation among Developing Countries,

b) Filling critical gaps in our internal competence; and

c) Project formulation and monitoring for bilateral and multilateral assistance.

IV. NATIONAL FOOD SECURITY

All the following major components of the National Security System should receive integrated attention :

a) Ecological security designed to protect the basic assets of agriculture;

b) Technological security designed to introduce high yield-low risk production techniques in all major farming systems and supporting production efforts with appropriate post-harvest technology;

c) Building up grain reserves;

d) Social security measures like the National Rural Employment Programme designed to accelerate economic growth; and

e) Nutrition education and promotion including the supply of safe-drinking water.

CONCLUSION

To sum up, we are entering a more difficult and hence more challenging phase of our agricultural evolution. Success hereafter will depend upon our ability to increase the *average yields of a farming system* by reducing the gap between potential and actual yields in the fields of small and marginal farmers and in dry farming and neglected areas. This, in turn, will call for greater efforts in fostering community endeavour in many areas of farm management. Also, all links in the production-consumption-trade chain will need integrated attention. Contingency planning and disaster preparedness should become integral parts of the planning process. Non-monetary inputs will have to receive as much attention as cash inputs. We can then derive greater benefit from our vast agricultural assets and minimise our agricultural liabilities.