Chapter XV

Enlarging the role of Private Sector in transforming Maharashtra’s agriculture

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Enlarging the role of private sector in transforming Maharashtra’s agriculture including the initiation of an era of genetic revolution, with attention to hybrids of Wheat, Rice, Cotton, Pigeonpea, Jowar, Bajra and vegetable crops.

Executive Summary and recommendations

The need for increasing food production to meet the needs of the expanding population by use of reducing resource base of cultivable land and water is recognized by the group. Hence effective and efficient use of these resources is a must. The group felt that growth in agricultural production will have to be based on productivity improvement by application of technologies like genetically improved seeds, Drip irrigation and Plasticulture, Nursery development, Biofertilizers, Biopesticides, Agro Processing, Agri Service Centres, Watershed Development and Use of Information Technology etc. Successful adoption of these technologies will need skilled manpower and hence aggressive training and skill development focused on rural youth and rural women will have to be undertaken. These steps if taken will not only enable improvement of productivity and production by use of existing natural resources but also enable creation of numerous skilled employment opportunities for the rural women and youth.

- Increased Food for expanding population will have to be achieved through
  - Effective and efficient use of reducing resource base of land and water
  - Employment generation through application of Technology
    - Genetically improved seeds
    - Plasticulture: Drip Irrigation and Poly houses
    - Nursery Development
    - Transgenic Crops
    - Information Technology
The sub group also felt that watershed development, improvement of soil health, training in new technologies particularly focused on rural women and youth, to enhance their skills and large scale demonstrations of the new technologies will be a pre requisite for this technology led agriculture development in the state.

It must be noted that application of technology in any field of enterprise has resulted into an increase in need of skilled manpower. This has been demonstrated in the industrial sector and agriculture will be no exception. Hence use of genetically improved seeds, Drip irrigation systems, Plasticulture, Nursery development, Biofertilizers, Biopesticides, Agro-processing and Agri-Service Centre etc., will create numerous skilled job opportunities which need to be captured by aggressive training of rural youth and rural women.

The Sub group has made an attempt hereto detail employment generation opportunities which can be generated in agriculture sector in the state in the coming 25 years which are elaborated in the enclosed reports.

They recommend the following:

(1) Policy of self employment must be framed by the government rating its clear cut objectives and goals.
(2) Link up development schemes proposed to be implemented by the Government to self-employment creation. (Watershed Development)
(3) Availability of credit at attractive terms is made for self-employment generation projects stated in the report.
(4) Provide financial support for Krishi Udyojakta Yojana to the tune of Rs. 10 Crores per year.
(5) Take policy measures to create positive environment for adoption of new technologies in agriculture.
(6) Develop linkages between farm and market to ensure remunerative prices to farmers and employment generation.

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<th>Areas identified for creation of skilled jobs</th>
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Introduction:

Production coupled with generation of employment opportunities is the key to progress. Creating adequate employment opportunities will help in maintaining social peace and integrity. The issue of unemployment can be overcome by long term planning, vision and policy initiatives.

The nature of profession and employment is changing very rapidly due to technological progress in the current century. Due to industrialization, employment opportunities have been generated in urban areas; however 65% of the population is directly or indirectly dependent on Agriculture and allied sectors for their livelihood. Hence creation of employment opportunities in this sector is very critical for the well being of the people of the state.

The average per capita annual income in the state is Rs.10904 against a per capita annual income of Rs 5500 for those involved in Agriculture and allied sectors and a per capita income of Rs 15000 for those involved in industrial sector. 17% of the people under the poverty line are in urban areas primarily comprising of people who have migrated from rural areas in search of employment opportunities.

This emphasizes the need for creating employment opportunities in rural areas and that too in agriculture sector. Agriculture sector will be a major sector for creation of employment opportunities as the industrial and service sector will not be able to cater to more that 30% need of the employment required.

The above principle is agreeable and suitable action about the same need to be taken. Sustainable marketing system for agriculture produce, drip and sprinkler irrigation for increasing irrigated area, waste land development to bring it land under cultivation, agro processing, cottage industries in rural areas, increasing seed production programme and soil and water conservation work are the few activities having greater scope for employment generation. Providing basic infrastructure and capital investment will be worth while for development of future employment generation.

Some areas which provide opportunity to creating employment in Rural areas have been enumerated below:

Summary

- Productivity improvement will have to be technologically led
- Application of Technology will create skilled job opportunities
- Estimated skilled employment creation at 321.14 million man days per annum
- Agricultural production increase estimated at 11.54 million tons per annum
- Water saving of 38235 lac cubic meters per annum
1. **Seed Production:**

The state would need food for meeting the increasing population. The various important crops offer opportunity and potential to achieve the goals of meeting the calorific and nutritive requirements. The application of hybridization technology, recombinant DNA technology, will lead to enhancement of primary and secondary employment opportunities. The total area under hybrid crops would increase to 9.72 million hectares resulting into creation of 58 million man days of employment. The secondary employment opportunities created due to increased production and ancillary agricultural activities is estimated at 22.06 million man days. Attempts must be made for distribution of seeds and planting material at convenient locations (in every village) for large scale adoption. Crop wise details are provided in Annexure 1, Table 1.

2. **Drip Irrigation:**

The total area covered under drip irrigation systems is estimated by the group at 1 million hectares under 19 different cultivation activities. The coverage will create employment opportunities in the industry besides creating additional employment opportunities in the rural sector for installation and maintenance of systems. These activities will create 1.432 million man days employment opportunity over 25 years. Besides generating employment opportunities, use of drip irrigation systems will lead to productivity increase resulting into additional production of 2.72 million tons and reduce water use by 38235 lac cubic meters. Annexure 2 Table 1, 2, 3

The group also felt that novel approaches like rain on rent, drip irrigation systems on rent be promoted for relevant applications.

Use of poly houses for cultivation of value added crops would increase and is estimated at 10000 poly houses of 500 square meters each. This activity would create direct employment of 50000 jobs.

3. **Use of transgenic crops:**

The use of transgenic crops has begun in the country with the approval of Bt cotton this year. It is estimated that transgenic varieties resistant to insects and diseases in field crops (Rice, Jowar, Maize, Cotton, and Pigeonpea) and Vegetable crops (Bhendi, Eggplant, Tomato, Hot Pepper and Gourds); herbicide resistant varieties in field crops (Soybean, Wheat, Cotton, and Maize) and certain vegetable crops will come in use. The conversion to transgenic crops would be rapid due to the significant benefits they can offer and an area of 5.7 million hectares will be covered over next 25 years.

It will lead to productivity improvement as well as reducing the use of harmful and toxic chemicals leading to improvement in the environmental conditions. It will also improve the competitiveness of the farmer by reducing his costs and improving
productivity. The need for dissemination of knowledge about transgenic crops will create employment opportunities of 5.7 million man days. Annexure 1 Table 2.

Transgenic crops like BT cotton will lead to the reduction of pesticide sprays thus resulting in Manpower use to the extent of 1.4 million man days.

4. **Nursery development:**

Use of seedlings for kitchen gardens as well as field and vegetable crops will increase in the state particularly in areas adjoining metro cities, where value of land is high and efficient use of such lands is envisaged. The time gain achieved through the use of seedlings for planting is also being realized by the farmers. It is estimated that 10.43 million hectares (70% of the total area in crops, Ref Annexure 1 Table 1) would be planted by use of seedlings. One acre of seedling cultivation and transplanting creates 318 and 5 man day’s employment potential. The total employment created for transplanting this area would be 92.25 and 130.55 million man days respectively.

5. **Biofertilizers:**

At present there are 45 biofertilizer production units in the state having an annual production capacity of 10,000 metric tons. The actual production and use of biofertilizers is between 2500-3000 metric tons per annum. This indicates that the State is lagging behind in capacity utilization. On the other hand, the state is having a potential of 88,000 metric tones for agricultural and horticultural crop production per annum.

Integrated Nutrient Management is going to be more and more crucial as we move towards sustainable and eco friendly agriculture. Hence efforts to popularize the use of bio fertilizers will have to be made to increase its use to the fullest extent.

Full capacity utilization of the existing biofertilizer production units will enhance the employment generation in the state. On an average, about 10 personnel are engaged in a production unit of 150 metric tons/annum and full capacity utilization will generate employment to 450 people in the state in existing units.

There is a potential for additional 5000 units having a capacity of 150 metric tons annual production capacity each in local areas where the potential for use is high and where no units exist. This will create direct employment opportunities of 15 million man days of skilled work. Besides employment opportunity creation, the use of bio fertilizers will improve the organic content of the soil by 10-15% leading to improved soil health and crop productivity.
6. **Bio pesticides:**

Today bio pesticides are used on 10.50 lac hectares. Mostly only one application of bio pesticides is made. There is much room to increase number of applications of bio pesticides and increase the area too.

There are 65 units which are producing bio pesticides out of which 60 are in the private sector. This is a cottage industry requiring small investment ranging from Rs. 12–15 lakhs per unit as compared to large chemical industries. One unit provides direct employment to about 15 persons.

The area can be increased to 40 lac hectares and the number of applications can be increased from 1 to 3. This will necessitate increased production of bio pesticides to at least by four folds. The additional requirement can be met by producing increased volumes of bio pesticides by increase in capacity and number of units.

One unit can cover about 10 thousand hectares of cropped area if 3 applications are made. To meet this additional requirement of bio pesticide, 250 new units will be required to cover the increased area and number of sprays.

This will generate 1.1 million man days of employment opportunities some of which will be of highly skilled nature.

7. **Agro Processing:**

Agro processing is one of the basic industrial activities in our economy. The industry is labour intensive and has high employment potential. Maharashtra offers great potential for this as it leads the country in the production of tropical fruits like Banana, Grape, Mango, Guava etc. This industry has a large potential in domestic and export markets.

The rural youth can play a significant role in minimising post harvest losses which amounts approx Rs.770000 million per annum. Thus creating income and employment opportunities through acquisition and practice of science and of skills for post harvest management is possible as indicated above.

As against the production of 93.5 lac tons of fruits, vegetables and spices, only 2 lac tons processing capacity is available today in the state. (Department of Horticulture, Government of Maharashtra, 1967-97). If we want to process at least 25% of agriculture produce, we will have to create processing facilities which will create 4.5 million man days employment opportunities.
8. **Agro Service centers:**

The agri-business centres besides providing market information support to the farmers could also provide input support and services on payment and can provide employment to rural youths. These centres would produce and supply seed for the farmers, seedlings quality planting material of horticulture and vegetables, bio-control agents, bio-fertilizers; provide testing facilities for soil irrigation water, fertilizers, bio-fertilizers, pesticides, veterinary services, livestock produce processing, etc. on payment basis. There are 30,000 seed fertilizer and pesticide dealers in the State. Recently, Govt. has taken decision to issue sale licenses to Agril. Graduates. Thus 15000-20000 agriculture graduates will be engaged in providing input supplies along with transfer of technology. This will generate additional 17.3 million man days employment opportunities.

9. **Watershed Development:**

Conserving and managing both water and soil to enhance production as well as to provide sustainable livelihood opportunities to the people, especially for those who are dependent upon rainfed agriculture is very crucial for Maharashtra.

Maharashtra is the second largest state in India, both in area as well as in population. It has limited assured irrigation capacity and around 84% of its agricultural land is rainfed. Besides this, the soil is of poor quality and 42.5% of the land is degraded. Besides this 159 lakhs hectares of area is drought-prone.

Given this resource poverty, the best possible strategy is to conserve available resources whether it is soil or rainwater and create judicious utilization of these. In this context past experience has shown that adopting watershed development and management improves works productivity of the land and the bio-mass base creation for other related agro-based activities like dairy etc.

This large-scale watershed development envisages activities to be undertaken on a war footing giving priority to the most degraded areas first followed by the entire rainfed land resources.

This project on implementation will generate employment to the extent 127 million man days employment opportunities.

10. **Krishi Udyojakta Yojna:**

This scheme implemented by the government offering large no of courses for creating skills leading to self employment has employment generation potential. It was felt by the group that special emphasis on training on entrepreneurship and marketing of agriculture produce is extended to the rural women and rural youth, to enable them to apply marketing techniques for disposal of their farm produce. Details of the scheme which are being implemented are in Annexure 3.
11. **Application of IT in Agriculture**

Information Technology has become all pervasive in our day to day life. Agriculture is no exception. Internet, which stands for all compassing networks carrying data, at very low cost, at the speed of light in ever growing capacities, has become an household name in India and it is estimated that there will be 10 million internet connections and 23 million users by December 2003.

Internet is enabling access to information without any discrimination whatsoever as regard race, color, religion, gender, looks, age or location. One can use it from where one is. E-commerce and e business will proliferate with proliferation of Internet and its impact on Agriculture will be overwhelming.

Already information technology is being used as an effective tool for dissemination of technology to farmers, conveying package of practices, collecting data on land suitability for different crops, surplus/deficit food grain producing areas, information on market trends and weather conditions, etc.

Use of Internet and other Information Technology based services will be crucial for achieving technology led productivity growth in agriculture in the state. The same could be achieved by having an internet kiosk in each of the 38839 villages of the state. Besides imparting skills to 50000 plus rural youths and , it will create 14.18 million man days of employment potential for young educated rural youth both boys and girls.

There have been instances where corporate sector has used Information Technology for agricultural productivity improvement by dissemination of technology, providing market information, etc. One such prominent example is that of ITC’s e **chaupal** implemented in the state of Madhya Pradesh. This experience has been highlighted in Annexure 4.

The members of the sub group felt that the activities stated above, if implemented by all stake holders have the potential to create skilled employment opportunities estimated at 321.14 million man days per annum, improve agricultural production by 11.54 million tons, save 38235 lac cubic meters of water. This can be done through the available resource base. This will have an overall positive effect on rural incomes and prosperity. It is urged that the government creates a facilitating environment to enable all stake holders to participate in this development and achieve the goals stated therein.
**Annexure 1:**

**Jowar:** The Kharif area may be reduced but not significantly as the fodder requirement of the state has to be met. The area may not increase but remains stagnant. The current level of hybrid acceptance is 85% which can be increased to 95% over the next 25 years. There is need of breeding 140 days duration kharif hybrid jowar to overcome the blackening and fungi infection of grain & fodder.

**Bajra:** Currently hybrids are grown over an area of 60% and it can move to 100% over the next 20 years. The crop is grown on average soils and with limited resources. The potential for expansion of the area under this crop is limited and hence forecasted area is restricted to current levels.

**Tur:** This is an important pulse crop of Maharashtra. It is also highly remunerative to the farmers. Currently farmers grow open pollinated varieties. There are efforts for developing hybrids and they are likely to succeed in the near future. The development of hybrids to suit different maturity requirements will lead to 100% conversion of varietal area to hybrids. This crop also offers potential for expansion in area due to the high requirement of this pulse in the Indian diet (which is being fulfilled by imports today). The area is projected to increase from 1.1 to 2 million hectares in the present. The level of hybrid acceptance would be 90%.

**Cotton:** American cottons: The total area estimated under cotton cultivation is 3 million hectares out of which 2.4 million hectares is American cotton. The total hybrid adoption today is at 55% of the area which could move further to 75% in the coming years.

The Deshi (diploid) cotton area is estimated at 0.6 million hectares. Currently the area is planted to open pollinated varieties only. Hybrids suitable for rainfed conditions have been developed and it is expected that the same would cover the entire 0.6 million hectares. It is likely that some area expansion might also take place replacing the hirsutum cottons due to hardiness and better adaptability of these hybrids to adverse conditions.

**Sunflower:** The area is expected to remain constant and the hybrid coverage, which is currently at 100%, will continue. It is grown in parts of Marathwada and adjoining areas of Vidarbha. It can be grown as an alternative to cereal crops and improve production of oilseeds thereby reducing imports of the same.

**Safflower:** It is an important oilseed crop suitable for cultivation in areas with limited resource. It is expected that the 0.5 million hectares area
currently under its cultivation will be converted to hybrids over the next 25 years. It is also likely that the area would expand due to its adaptability to limited resource conditions.

**Wheat:** Wheat is grown over an area of 0.7 million hectares. The entire area will be converted to hybrids over the next 25 years. There will also opportunity to grow durum hybrids for specific end uses.

**Rice:** The cultivated rice area in Maharashtra is estimated at 1.48 million hectares and is grown in the traditional areas of Konkan and Chandrapur Districts. The entire area is expected to be converted to hybrids similar to the way it has happened in China, over the next 25 years leading to employment generation and enhancement of production.

**Vegetable crops:**

**Eggplant:** The total cultivated area of 30450 hectares will be converted to hybrids with the right kind of hybrids. The area will expand from its current level of 30450 hectares with the improvement in the economy and the general purchasing power of the user.

**Bhendi:** Bhendi is grown over an area of 26250 hectares. 90% area will be converted to hybrids from the current level of 20%, over the next 25 years with development of hybrids resistant to the virus diseases. It might expand to greater area with the improvement in the economy.

**Hot Pepper:** Hot pepper is cultivated over an area of 100000 hectares. The use of hot pepper is in three different segments namely table use (green), use as a spice (Red) and uses for industrial purposes. (For extraction of oleoresins etc.) The area under hybrids will move to 90 %. It will lead to enhanced productivity and employment generation.

**Onion:** Onion area is estimated to remain static at 118262 hectares. The most commonly used types will continue to be the red onions for table purposes. However the market will distinguish itself between fresh and processing types in the next 25 years with the use of high TSS hybrids and varieties for dehydration purposes. 90% of the total cultivated area will be converted to hybrids over the next 25 years.

**Tomato:** The area is estimated at 37782 hectares and is unlikely to change in the future. However market segmentation will take place for table use and processing purposes. The processing types would be primarily for production of paste, juices and canning whole tomatoes. The hybrid area will expand from the current level of 30 % to 90%.