CHAPTER = III

MAJOR INGREDIENTS OF PACKAGE PROGRAMME
The Package Programme heralded a new era in agriculture by introducing an intensive agricultural strategy to modernise and to commercialise agriculture. Hitherto, agriculture was treated as a matter of manual labour only and mental acumen was not applied in the agricultural operations. The rapid development in science and technology opened new avenues for 'Green Revolution'. The recent developments in chemical and biological technology have increased the possibilities of metamorphosis of the traditional agriculture. The agricultural research and technology which was confined to research laboratories only, has to play a role of paramount importance in transferring the agriculture from consumption purpose to production for market purpose, and from extensive cultivation to intensive...
cultivation. Prior to package programme, attention was not concentrated on the application of modern science and technology in agriculture. Hence, the traditional skills and inputs were readjusted and popularised in the rural areas which could not bring about a change in the level of traditional output.

The package programme was well equipped with the modern technology and material resources. This programme was introduced in the fifteen districts of the country of which 5 districts have been designated as innovative districts i.e. Raipur, Sambalpur, Thanjavur, West Godavari, and Ludhiana. The innovative districts have to play a role of pathfinder to develop new ideas, new practices, and new ingredients of improved package of practices. The experiences and practices of these innovative districts are to be spread out in other districts.

It has been realised that the task of modernisation and commercialisation of agriculture is not smooth and simple; on the contrary it involves complications and tedious implications. With a view to facilitate the process of agricultural development, the programme has been phased into three stages viz:

52—Earl O Heady, Expanding Functions of Indian Agricultural Economics (Delhi: Ford Foundation, November, 1969), P. 1.
1-The first stage consists of implementing a simple farm plan on key crops.

2-The second stage consists of the extension of package of improved agricultural practices regarding the important crops raised on the farm.

3-The third stage aims at the maximum utilisation of farm resources by working out the optimum combinations of inputs. The establishment of agro-industries and enterprises using modern science and technology has been considered the main task to be done in the third stage.

Administrative Pattern:-

At the central level, there is a working group of the representatives of the Department of agriculture; Ministry of Community Development, and Panchaytraj and co-operation; Ministry of Finance; Ministry of irrigation and power; Planning Commission of India; and Reserve Bank of India under the chairmanship of a Special Secretary to the Department of Agriculture to co-ordinate the activities and to provide leadership and guidance to the programme. But now, the post of Special Secretary has been abolished and the working group has become defunct. At present, there is a project director of Intensive Agricultural District Programme in the Directorate of Extension who is responsible for the implementation of the programme.

At the state level, the Co-ordination
Figure 2: Present Organisation of Package Programme in Raipur District.

At District Level

- Collector

- Project Officer
  - ASSTT. DEPUTY TECHNICAL
  - SUJEC T-MATTER / ASSTT. STAFF.
  - OFFICER OFFICER SPECIALISTS REGISTRAR.
  - 1-CROP PRODUCTION.
  - 2-PLANT PROTECTION.
  - 3-PARM MANAGEMENT.
  - 4-SOILS & FERTILISERS.

At Block Level

- Block Development Officer. Now ASSTT. Project Officer.

Ag. Extension Officers Extension Officers Co-operatives

- Village Level Workers 20
- Cooperative Supervisors 4-5.

Implements Information Soil Testing Quality Survey

- Workshop
  - 1-Agr. Engineer. 2-Agr. Information Officer. 1-ASSTT. Soil. 1-Seed 1-Statistician.
  - 2-ASSTT. Agr. Engineer. 2-ASSTT. Agr. 2-Technical Officer. 5-Investigators.
  - 3-Mechanic. Officer. 3-ARTIST. PHOTOGRAPHER.
  - 4-Computers.
Committees have been set up to supervise and guide the district programmes. The state departments of agriculture have the nucleus of the staff including the subject matter specialists and technicians. Agricultural universities have been linked with the state departments of agriculture. These Universities have to play the role of knowledge centres. The liaison between the university and extension has been strengthened by working together of the subject matter specialists from the university and the agricultural department on some selected projects.

At the district level, the Collector is responsible for the implementation of Package Programme. The district Project Officer at the district level co-ordinates the activities of various departments. He is assisted by the four subject matter specialists, Assistant/Deputy Registrar, Statistical Officer, and a Research Officer. At the block level, an additional staff of 10 Village Level Workers, 4 Extension Officers of agriculture, 1 Extension Officer of co-operatives, and 4 to 5 co-operative Supervisors has been provided. The general frame work of Community Development Programme has been adopted for the execution and implementation of the programme. The village level worker has been relieved of non-agricultural activities and he has been taken under the control of Agriculture Department. At the Block level, the Block Development Officer was made responsible for the implementation of the Programme.
This post was abolished in March 1966 and was not replaced by any other similar post. The normal staff of community development programme was entrusted with the work of Package Programme.

Package of Improved Practices:

The package of improved practices included improved seeds, fertilisers, pesticides, improved agricultural implements, soil and water management etc.

**Improved seeds:**

Agriculture is not so much a matter of chemical or mechanical technology as it is a matter of biological technology. It does not matter much how we sow but what we sow. "As you sow, so shall you reap" is a proverbial saying. The local varieties of seeds which might have been high-yielding varieties in the past, have now become ineffective and less productive. Although these varieties are locally adaptive and disease resistant, but their low yield has become a serious limiting factor in raising the yield level. The quality of improved seeds includes the following factors:

1. Germinating ability.
2. Colour of the seed.
3. Seed weight.
4. Uniformity.
5. Free from weeds.
6. Free from seed-born disease.
7. Free from damage.
8. Free from adulteration.
10. Yielding capacity.
11. Good for consumption purpose.
It has been realised that improved seeds should possess high yielding capacity and should be superior to local varieties in respect of all characteristics. Another quality of improved seeds which has been recognised recently, is the minimum number of days to be taken in ripening so that the double crops can be grown successfully.

Multiplication of Improved Seeds:

When the improved variety of seed is released by the breeder, it is provided for multiplication and thereafter supplied to the farmers. To maintain the standard and purity of seeds, the Food and Agriculture Department has laid down the following steps to be taken:


Breeder's seed is raised from the nucleus seed which the breeder raises once in three years. The plot in which the nucleus seed is grown is kept aloof from the plots of other varieties. The progeny of this seed forms the breeder's stock. The breeder's seed is again multiplied as foundation seed by the qualified technicians. The progeny of foundation seed is multiplied on the registered seed farms. Finally, the registered seed is supplied to the certified farmers or the seed growers for multiplication. The progeny of certified seed is supplied to the farmers. In package districts, the government farm multiply the foundation seed for the final distribution.
In package programme biological research and technology have been considered of paramount importance. Prior to package programme, improved seeds did not mean more than the processed and unadulterated supply of local seeds. As a result, the fertilisers were treated as the most effective production factor which raised the yield level to a very little extent. This was also an important factor responsible for poor impact of Community Development and National Extension Service programmes. The local varieties of seeds were not fertiliser responsive and could not attract the farmers to use the fertilisers to a great extent. Consequently the farmers became more rigid and anti-fertiliser minded. With the inception of Package Programme, biological knowledge and research received due attention and attention was concentrated on the hybrid seeds. The exotic varieties were developed and made adaptive to local conditions. These varieties were highly responsive to fertilisers and convinced the farmers regarding the profitability and suitability of new production factors.

Adequate funds have been provided for the production of certified seed and for quality control programme in package districts. It was decided to establish a seed industry for producing, processing, storing, treating, packing and distributing the certified seed to the farmers. The quality seed supplied to the farmers, have to be used for the period of three years without much deterioration in quality and thereafter new seeds would be required to
The popularisation of high yielding varieties of seeds has now become the part and parcel of the agricultural development programmes. The new agricultural strategy of Fourth Five Year plan is based on the high yielding varieties. A large area is to be covered under the high yielding varieties of seeds in the country.

Chemical Fertilisers:

The use of chemical fertilisers is an essential ingredient of the package of improved practices. This production factor is capable of making substantial increase in yield level, if it is accompanied with other factors of production. Land is like a living being. It provides nourishment to the crops and in turn calls for nourishment through organic manures and chemical fertilisers.

Land does not possess incessant fertility. On the contrary, the fecundity of soil goes on decreasing with subsequent crops. Just as human energy decreases year after year and more rapidly in the absence of nutritive diet, the power of soil also diminishes crop after crop and more rapidly in the absence of adequate fertilisers and manures. Heavy expenditure on irrigation, drainage, bunding, terracing, and improved seeds etc., would result in waste if the fecundity of soil is not maintained by the application of suitable doses of fertilisers and manures. The nutrient elements which are removed by the
differnt crops require immediate and replenishment for the maintenance of production capacity of land.

TABLE-III

<table>
<thead>
<tr>
<th>Crops</th>
<th>Nitrogen</th>
<th>Phosphoric Acid</th>
<th>Potash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paddy:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grain.</td>
<td>21</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>Straw.</td>
<td>30</td>
<td>3</td>
<td>72</td>
</tr>
<tr>
<td>Total.</td>
<td>61</td>
<td>21</td>
<td>82</td>
</tr>
<tr>
<td>Wheat:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grain.</td>
<td>22</td>
<td>25</td>
<td>12</td>
</tr>
<tr>
<td>Straw.</td>
<td>25</td>
<td>7</td>
<td>52</td>
</tr>
<tr>
<td>Total.</td>
<td>50</td>
<td>7</td>
<td>64</td>
</tr>
<tr>
<td>Maize:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grain.</td>
<td>24</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>Straw.</td>
<td>30</td>
<td>10</td>
<td>26</td>
</tr>
<tr>
<td>Total.</td>
<td>64</td>
<td>26</td>
<td>34</td>
</tr>
<tr>
<td>Early Potato.</td>
<td>76</td>
<td>27</td>
<td>125</td>
</tr>
<tr>
<td>Late Potato.</td>
<td>92</td>
<td>42</td>
<td>188</td>
</tr>
</tbody>
</table>

Table adopted from Farm Bulletin No. 2, by A.K. Dutta published by The Indian Council of Agricultural Research, Jelni.P.O.
The removal of these nutrients is to be replenished immediately by the balanced doses of fertilisers and manures for growing subsequent crops. In traditional agriculture, organic manures were generally used for the replenishment of the removed nutrients but the quantity of the manures used in the fields remained inadequate. In package programme, fertilisers have been treated as key production factor and the success in raising the yield level depends largely on the use of recommended doses of fertilisers. The modern research in chemical technology has opened new avenues for rapid progress. Chemical fertilisers provide ready made plant nutrients to the crops and fructify the soil to raise more than one crop in a year. The only limiting factor with the use of fertilisers is the lack of assured water supply and a good structure of soil. Edward C Higbee has observed that:

"The alarming fact is that while reasonable fertiliser application improved yield, they alone would not sustain them as erosion proceeded. Soil productivity is ....heavily dependent upon good structure, texture, meiowness, and micro organic life. A dead structureless sticky soil is as poor a medium for corn as it would be for a geranium on a roof garden. It is just as possible to kill a soil as it is to kill a plant."

A provision of soil testing laboratory was made to test the soil texture and fertility to recommend the balanced doses of fertilisers. The chemical fertilisers are meant to supplement the local manural resources for improving and maintaining the soil fertility. Adequate supply of Nitrogenous, Phosphatic and Potassic fertilisers is assured in package districts. Apart from this, the farmers have been induced to increase their local resources of organic manures such as animal waste, human waste, green manure, rural compost, urban compost, oilseed cakes etc. The vegetable crops and intensive cropping pattern require heavy doses of fertilisers including both, the micro-nutrients and macro-nutrients to maintain the fecundity of soil.

Plant Protection Measures:

Plant protection is an important aspect of package programme which seeks to ensure that the maximum potential of crop is harvested by the farmers. Under traditional agriculture, crops were left at the mercy of God or fate and a devastating damage was always inflicted on the crops by the horde of insects and pests. The farmer was helpless as adequate plant protection measures were not available. A serious thought was given to this problem to fight against the enemies of crop which roughly reduced the harvest potential in unprotected crops by 10 to 20 per cent. It was for the first time, when the
Plant protection measures were included in the improved package of practices.

The package programme recognised the tremendous damage caused by the insects, pests, rodents, plant diseases, weeds, and parasitic flowering plants. The effective plant protection measures were included in the important activities to attack on the problem from all corners. The pests and diseases cause damage right from the moment, the seed is put into the soil and up to the stage of storage. The most effective plant protection measures included the treatment of soil against various insects at the time of sowing, treatment of seeds against various diseases, and the adoption of prophylactic measures.

The adequate supply of plant protection chemicals and implements such as insecticides, pesticides, weedicides, fungicides, herbicides etc. with hand and power sprayers has been ensured to the farmers through co-operatives or government agencies. The private dealers are playing an important role in supplying the chemicals and implements to the farmers at reasonable prices. Adequate technical 'know how' is also provided to the farmers to handle the chemicals safely since the inadvertant or unscrupulous use of chemicals may damage the crops and cause harm to the farmers who use them. The following steps have been suggested to be taken in the package districts:

1. Plant protection chemicals and implements have to be stocked in adequate quantities in the various depots.
for timely supply.

2- Prophylactic treatment of seeds and crops on an area wide basis to ward-off attack of pests and diseases, has to be undertaken.

3- Measures have to be taken to undertake rat control, seed control, and storage grain pests control on district wide basis.

4- Steps have to be taken to check the spread of pests by treating the nurseries on large scale, and by eliminating newly found pests.

There is/provision for adequate research in plant protection to analyse the problem of plant protection and to find out the most effective chemicals for the treatment. One plant protection specialist has been posted in every package district. The effective use of weedicides has been suggested by the research centres as the grass, or weedy bunds not only served as centres of infestation for Gundhi bug, but also served as weeding centres and infection areas for these pests. The stores and warehouses have to be treated against rats and other insects. Collective efforts have been suggested by the research centres to tackle rat and rodent problem. The farmers have to be educated in the science of plant protection to diagnose and to recognise various diseases and pests.

Adequate training has been provided to plant protection staff to deal with the complex problems of plant protection. The chemicals are often amazingly potent and at times hazardous to the crops and to the user if
improperly used. The modern science has provided concentrated and most effective poisonous chemicals which require technical knowledge and skill.

**Agricultural Engineering:**

The traditional agriculture used the traditional implements which required comparatively more manual labour for agricultural operations. Besides, these implements were time-consuming and less effective for better agricultural operations i.e. ploughing, sowing, and cultural operations. Although improved agricultural implements do not increase output to a desired extent but their use reduces the cost of cultivation and facilitates the better agricultural operations. A provision for agricultural workshop was made in each package district to develop suitable agricultural engineering. While preparing the farm plan of the cultivator, suitable tools and implements have to be suggested, keeping the following points in view:

1. Type of soil and its hardness.
2. Irrigation facilities available.
3. Type of crops grown.
4. Size of holding.
5. Resources of the farmers.
6. Power available - bullock, human, oil, electricity etc.

A number of demonstrations and field trials of the suitable implements have been arranged to
convince the farmers regarding the effectiveness of the implements and their profitability about one month ahead of the season. The district workshop centre has been entrusted with the following activities:

1- To make improvements and to develop prototypes of better farm implements and to develop power suitability of the implements.

2- To train village artisans and cultivators in selection, care and repair of improved implements.

3- To service and maintain vehicles and transports.

The district programme included the local construction and improvement of implements, training to the extension staff and the arrangement of effective demonstrations on the farmer's field. The Agricultural and Power Development Centre at Allahabad has helped the package districts in meeting the needs of improved implements, power-driven machines, tractors, diesel or electric pumps etc. have been popularised among the farmers to quicken the task of modernisation of agriculture.

Water use and management:

The package programme recognised the necessity of efficient and timely use of the available water according to the soil texture and crop requirements. A scheme of water use and management was undertaken to demonstrate the farmers the methods to solve irrigation and drainage
problem. One water specialist was appointed in some of the
districts with supporting staff. The water management
included the various measures such as construction of
irrigation channels and their improvement, land levelling,
proper bunding and provision of drainage facilities,
training of staff in water use, arrangement of demonstrations
on water requirements of crops and frequency of irrigation etc.

**Package of Services.**

Apart from the package of practices, the
package programme provided package of services to the farmers
which included supply of credit, and production requisites;
marketing of produce, technical guidance etc.

Supply of credit and production requisites:

one of the basic factors of the
package programme, was the provision of adequate and timely
supply of production based and production oriented credit
to the farmers. In the package districts, the institutional
set up of co-operatives was utilised to finance the member
farmers. The co-operative societies were entrusted with
the work of advancing the short term and medium term credit
to the farmers on the basis of crop production plans. The
reserve bank of India supplemented the resources of the
Central Co-operative Banks. The state governments took
the various measures to ensure an adequate flow of credit through the co-operatives.

Prior to package programme, the credit factor was not properly recognised in the rural uplift programmes and the farmers could not modernise their farm for want of adequate credit. They could not get rid of the village money lender who advanced inadequate credit at exorbitant rates of interest which ranged from 24 to 40 per cent per annum. Since the traditional agriculture was not a surplus producing economy to the cultivators, he often hesitated to adopt the available improved agricultural practices. The package programme recognised this factor and made suitable provisions for the supply of adequate production credit at suitable rates of interest. The supply of cheap credit to the needy farmers was treated as the fundamental characteristic of the programme. The loans were provided by the co-operatives in cash and kind as reflected in farm plans in suitable instalments according to the agricultural operations involved.

The supply of fertilisers, seeds and pesticides was made available to the farmers at suitable distance. The village service co-operative societies comprising of two to three villages managed the supply of production inputs at proper time. The cash loans were also sanctioned to the member farmers by these societies through Central Co-operative Banks. Credit was linked with marketing
in order to strengthen the marketing structure and to facilitate the recoveries of loans. The simplified procedures were to be adopted by the co-operative societies in sanctioning and disbursing the loans. All the hindrances — such as low security limits, low maximum borrowing limits, mortgaging of land as security of loan were removed in order to provide adequate credit to the farmers. Since modernisation of agriculture involved supply of costly inputs and sophisticated technology, the package programme built its edifice on the sound and viable structure of co-operatives.

Marketing of Produce:

The ten point programme included the assurance of remunerative prices to the farmers and an effective marketing system. Since the modernisation of agriculture aimed at the surplus production of agricultural produce, the necessity of an effective marketing system was earnestly felt. In traditional agriculture, a very little marketable surplus was marketed through the local businessman at the rates lower than the rates prevailing in the market. Besides, various malpractices such as improper weighment, unnecessary charges for Mandi expenses, share of middleman, deductions for Dhamada, Samlika, etc; deductions for Karda and Garda; weighment charges etc. were retarding the process of marketing. The Kachha and Paeka Adhastias were playing their role like monopolists. By and large, there was no representation from supply side.

It is for this reason, that the
necessity of sound marketing organisation was realised. It is astonishing that the farmer who is the producer of food grains, has no representation in fixing the prices for his produce. He accepts what he is given for his produce and pays what he is required to pay for the commodities which he purchases for investment purpose and consumption purpose. While on the other hand, the businessman and industrialists fix the prices for their goods and commodities above the marginal and average costs and leave no margin to the consumer to alter the prices. In agriculture, the picture is just reverse where the producer has no role to play in fixing prices for his produce. Naturally, the behaviour of cost of production is always neglected in the price fixation. It is due to this reason, that the prices fixed for agricultural products have been consumption oriented rather than production oriented.

To solve these problems, the government adopted a policy of minimum support prices for wheat and paddy. The marketing structure has also been reorganised in the light of various problems. The co-operative marketing societies have been established at each block headquarter. These societies purchased the food grains at fixed prices and provided various facilities to the farmers such as storage, linking, and processing etc. Under package programme, heavy loans were advanced which created the problem of recovery of the loans. Hence the main function of the marketing societies was the recovery of old loans through
The role of marketing societies was recognised of preponderant importance, since the modernisation of agriculture emphasised for the rapid increases in the level of production and marketable surplus. The need for modernising the rice processing industry was earnestly felt and a few modern rice mills were established.

Technical Guidance:

It was visualised that the improved agricultural practices or production factors would not bring about promising results if the technical guidance was not provided to the farmers. The modernisation of agriculture meant more science, more research, and more technology. The farmers, by virtue of being illiterate, had poor knowledge of modern techniques of agriculture. The package programme took this factor into account and adequate technical staff was posted at district and block level in package districts. In addition to subject-matter specialists in various fields at district level, additional extension officers of agriculture were posted at block headquarters to guide and to supervise the activities of the village level workers. The village level worker was given adequate training in new techniques of agriculture. The farmers were supplied with technical knowledge regarding the application of fertilisers, sowing methods, seed rates, cultural practices, and use of plant protection measures.

Supporting Activities:
Agricultural information unit included extension education activities through the wide publicity and various types of field demonstrations. For the dissemination of agricultural information, a nucleus information unit was set up in each package district. This unit has three main functions i.e. publication and distribution of the information materials to inform and educate the cultivators; assistance to the subject matter specialists in preparing special materials, visual aids etc.; and guidance to the village level workers in the preparation and use of simple visual aids in order to simplify their work with the cultivators.

In addition to these activities, the information unit undertook various measures for communication i.e. simple leaflets, statements covering the details of package programme, posters on improved practices, exhibits, photographs, cinema slides, charts and visual aids etc.

The extension education activities included field demonstrations of composite type to motivate the cultivators to adopt improved production practices. A large number of such demonstrations were laid out on farmers' fields and the results were compared with those of control plots. Information regarding the cost and output of cultivation for both the demonstration and control plots was collected and disseminated among the farmers.
Soil Testing:

For the scientific analysis of soil, a provision of soil testing laboratory was made for each package district. The soil testing laboratory had to test the soil samples, and on the basis of analysis, the recommendation regarding the balanced doses of fertilisers was made. Since the soil possessed different chemical compositions and texture, one common dose of fertilisers could not bring about suitable results everywhere. Hence, one soil testing laboratory was established in each package district with a capacity of 50,000 soil samples per year. The soil testing laboratories were started in the agricultural colleges and universities under the sponsorship of Indian Council of Agricultural Research.

Assessment and evaluation:

Since the inception of intellectual investment in agriculture, new problems have floated on surface in agronomic and agro-economic fields. For the solution of these problems, an assessment and evaluation unit was established in package districts to undertake agronomic and agro-economic studies. A research with supporting staff was posted to carry out special studies on operational problems arising during the course of implementation of package programme. The statistical department was also established at district level under the statistical officer to assess
the changes brought about by package programme, through benchmarking and assessment surveys. The crop-cutting experiments based on random sampling were introduced in package districts with higher precision. The benchmark and assessment surveys were carried on under the sponsorship of the Institute of Agricultural Research Statistics (IARS) New Delhi. Apart from research and evaluation unit at district level, the Expert Committee on Assessment and Evaluation was appointed by the Ministry of Food, Agriculture, Community Development, and Co-operation to review the progress of package programme.

These are the main ingredients of package programme which constitute the strategy of intensive agriculture. All the essential ingredients have been combined into one package to avoid fissiparous approach and to facilitate the farmers in the adoption of all the essential practices of cultivation.