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AN APPROACH FOR THE AGRICULTURAL  
STRATEGY IN THE  
FIFTH FIVE YEAR PLAN OF GUJARAT

by  
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T.R. No. 44

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To  
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Technical Report

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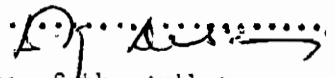
Under which area do you like to be classified? Agricultural Planning

ABSTRACT (within 250 words)

..... Given on the enclosed sheet .....

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The basic principle in developing an approach for the agricultural strategy in the Fifth Five Year Plan is that instead of super-imposing a growth rate of agricultural sector to be achieved in the Fifth Five Year Plan, it would be desirable to find out the achievable targets at the disaggregate level of the agricultural sector. This exercise would give the planners an insight into the strengths and weaknesses of each of the sub-groups in the agricultural sector. Following this approach it is suggested that the overall objectives of the agricultural strategy in the Fifth Five Year Plan of Gujarat should be based on the following premises :

- (1) It should provide at least coarse foodgrains and pulses for the weaker section of the population in Gujarat state to meet their minimum food requirement.
- (2) As Gujarat has comparative advantage in oilseeds, cotton, tobacco, sugarcane and fruits (particularly mango), and dairying the production of these commodities should be maximized with the available resources and new investments should be directed towards this effort.
- (3) Agricultural labour employed at present in agricultural sector should get such minimum wage that would bring them above poverty line.
- (4) The economy of small farmers should be improved in such a way that by the end of the Fifth Five Year Plan a substantial portion of this section is above poverty line.
- (5) The lot of marginal farmers should be improved by providing them additional employment in agriculture and efforts should be made to bring a substantial portion of this sector above poverty line.
- (6) As Gujarat is essentially a dry farming area, a major emphasis should be laid on the improvement of dry farming.
- (7) The major emphasis should be for protective irrigation against the natural hazards of the failure of rains during the later half of monsoon when crops are lost for want of minimum irrigation.

- (8) Input use particularly fertilizer should be increased substantially both in the irrigated areas and dry areas.
- (9) Irrigation facilities should be increased to the possible extent.

To meet these objectives emphasis should be laid to increase productivity of bajra from 1068 kg to atleast 1250 kg per hectare. The area under coarse grains would remain at the same level as in 1973-74 but their productivities would be improved. The area under rice and wheat would marginally increase and their productivities would increase substantially. There would be special emphasis on the increase in the productivity of pulses. There will be special emphasis on enhancing the productivity of groundnut. The production of oilseeds would increase from 1778 thousand tons to 2269 thousand tons. The productivity of cotton would <sup>rise</sup> ~~raise~~ from 197 kg in 1973-74 to 304 kg per hectare in the Fifth Five Year Plan. This would increase the production from 23 lakh bales in 1973-74 to 29 lakh bales by the end of the Fifth Five Year Plan. ~~By the end of the Fifth Five Year Plan~~ the daily per capita consumption of milk would increase from 175 gms to 200 gms <sup>by the end of the Fifth Five Year Plan.</sup>

The tentative targets for the Fifth Five Year Plan would be based on the achievable growth rates of different sub-groups of the agricultural sector. If these targets are achieved the compound rate of growth in agriculture in Fifth Five Year Plan would be 6.18 percent. To achieve these targets <sup>with</sup> ~~within~~ the constraint of social justice, special efforts will have to be made for the development of infrastructure, drought prone area programme,

and programmes for small and marginal farmers and agricultural labourers. The relationship between the development of infrastructure, special programmes and input and output programmes should be established. Based on these relationships the financial outlay of the Fifth Five Year Plan for the agricultural sector can be allocated among various programmes and activities.

An Approach for the Agricultural Strategy in the Fifth Five Year  
Plan - General

The basic principle on which the agricultural strategy in the Fifth Five Year Plan should be developed is that it should be consistent with the overall objective of "growth with social justice". Agriculture is the vital sector of the economy contributing about 49% to GNP and involving nearly 70 per cent of the population. The strategy for this sector will have its repercussion on the total plan.

In developing the strategy for agricultural sector the following steps may be followed :

1. Review of the experience during the four five year plans
2. Overall objectives of the Fifth Five Year Plan
3. Basic assumptions for the agricultural plan
4. Resource base
5. Developing agricultural strategy
6. Achievable Targets
7. Effect of Targets on SDP of agricultural sector
8. Required efforts to meet the targets:
  1. Development of Infrastructure
  2. Development of Special Programmes
  3. Programmes for Agricultural Inputs
  4. Programmes for Agricultural Outputs
9. Financial Outlay.

The agricultural sector is defined as consisting of the following activities :

1. Agricultural programmes including animal husbandry, dairying, forests and fisheries,

2. Cooperation, Community Development and Panchayats, and
3. Irrigation and flood control.

The review of experience of the four five year plans would reveal the strength and weaknesses of the agricultural economy. Based on this review and the overall objective of the five year plan, the objectives of the agricultural plan should be determined. While determining the objectives of the agricultural plan, a critical review of resource base should be made.

Instead of superimposing a growth rate of agricultural sector to be achieved in the Fifth Five Year Plan, it would be desirable to find out the achievable targets at the disaggregate level of the agricultural sector. This exercise would give the planners an insight into the strengths and weaknesses of each of the sub-groups in the agricultural sector. It would also help the state planners to bring the specificity and variations according to strengths and weaknesses of each sub-group in their states. In Gujarat state an attempt is made to find out the achievable rates of growth of each sub-group of the agricultural sector and then arrive at the overall rate of growth for the agricultural sector as a whole.

In fixing the targets for each of the sub-group of agricultural sector, the basic constraints emerging from the main objective of "growth with social justice" should be taken into account. For example in working out the targets for foodgrains in the Fifth Five Year Plan of Gujarat, the necessity of providing minimum quantity of coarse grains to the weaker section of the society is taken into account.

After fixing the achievable targets for each of the sub-groups of the agricultural sector, an overall rate of growth of the agricultural sector of the state could be determined and on this basis the rate of growth of the State Domestic Product of agricultural sector can be determined.

The efforts which the government have to make in the present agricultural economy which is largely under the private sector are (a) to create proper infrastructure facilities, (b) to undertake special programmes for special areas and special sections of the population, (c) to facilitate supply of agricultural inputs, and (d) to develop special output programmes.



Infrastructure facilities would include providing facilities for agricultural research, agricultural education, administration, development of irrigation facilities, institutional reforms in land ownerships and tenural relationships, soil conservation and land improvement programmes, creation of warehousing and marketing facilities, livestock improvement programmes, providing facilities of veterinary hospitals and dispensaries, helping establishment of modern dairies, research, education, and training and development programmes in forestry and fisheries.

In our economy government has taken the responsibility to develop cooperative structure, rural community development programmes and Panchayati Raj System, Infrastructural facilities required for these programmes should be provided in the plan.

The expenditure on infrastructure facilities required to develop the agricultural sector should have some relationship with the SDP of the agricultural sector. In allocating funds for the Fifth Five Year Plan it would be necessary to assess the investment in infrastructure facilities already created.

The special programmes should be developed for dry farming, drought prone areas and small and marginal farmers and agricultural labourers.

Proper assessment of agricultural inputs required to meet the achievable output targets should be made and state efforts should be directed toward facilitating the use of these inputs by the producers.

Special programmes for boosting the production of those outputs which have been lagging behind or which are new innovations should be taken up in the Fifth Five Year Plan.

The Financial outlay for the agricultural plan in the Fifth Five Year Plan should be based on these aspects and proper allocation among various programmes should be undertaken keeping in view the input-output relationship.

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An Approach for the Agricultural Strategy in the  
Fifth Five Year Plan of Gujarat (1974-1979)

INTRODUCTION

1.1 In developing an approach to the agricultural strategy the following steps have been followed :

1. Review of the experience during the four five year plans
2. Overall objectives of the Fifth Five Year Plan
3. Basic assumptions for the agricultural plan
4. Resource base
5. Developing agricultural strategy
6. Achievable Targets
7. Effect of Targets on SDP of agricultural sector
8. Required efforts to meet the targets
  1. Development of Infrastructure
  2. Development of Special Programmes
  3. Programmes for Agricultural Inputs
  4. Programmes for Agricultural Outputs
9. Financial Outlay

1.2 The agricultural sector is defined as consisting of the following activities :

1. Agricultural programmes including animal husbandry, dairying, forests and fisheries,
2. Cooperation, Community Development and Panchayats,
3. Irrigation and flood control.

## 2.0 REVIEW OF EXPERIENCE DURING THE FOUR FIVE YEAR PLANS

The Fifth plan for agriculture should be based on the experience gained in the four five year plans. The evaluation of the experience should highlight strengths and weaknesses of the agricultural economy.

In spite of the fact that relatively speaking less emphasis was given on the development of oilseeds, cotton and tobacco compared to foodgrains, the contribution of cotton, groundnut and tobacco as a group was higher than foodgrains in the gross value of output. (Appendix 1). Although separate figures of value added by each of the major sub-groups of crops are not available, it is assumed that the pattern of contribution of each of this sub-group would be of the same type as seen in the pattern of gross value.

The results of the four five year plans in terms of agricultural production particularly food production are quite encouraging (Appendix 2).

## 3.0 OBJECTIVES AND STRATEGY OF THE FIFTH FIVE YEAR PLAN

During the four five year plans it was assumed that a fast rate of growth of national income would by itself create more and fuller employment and higher living standards for the poor. These assumptions have not been fully borne out. While there has been an all-round increase in per capita income, the number of people below poverty line to-day is just as it was two decades ago. The new strategy in planning should therefore be directed to achieving economic growth with social justice and should include among its objectives, the reduction in the concentration of economic power, more equitable distribution of income and wealth, increase in production particularly of specified consumer goods with a view to maintaining a reasonable level of prices and a marked enhancement in the economic and social status of the underprivileged.

## 4.0 BASIC ASSUMPTIONS FOR THE PLAN OF AGRICULTURAL SECTOR

Considering the overall objectives of the Fifth Five Year Plan, the agricultural strategy should be based on the following premises :

- (1) It should provide at least coarse foodgrains and pulses for the weaker section of the population in Gujarat state to meet their minimum food requirement.

- (2) As Gujarat has comparative advantage in oilseeds, cotton, tobacco, sugarcane and fruits (particularly mango), and dairying the production of these commodities should be maximized with the available resources and new investments should be directed towards this effort.
- (3) Agricultural labour employed at present in agricultural sector should get such minimum wage that would bring them above poverty line.
- (4) The economy of small farmers should be improved in such a way that by the end of the Fifth Five Year Plan a substantial portion of this section is above poverty line.
- (5) The lot of marginal farmers should be improved by providing them additional employment in agriculture and efforts should be made to bring a substantial portion of this sector above poverty line.
- (6) As Gujarat is essentially a dry farming area, a major emphasis should be paid on the improvement of dry farming.
- (7) The major emphasis should be for protective irrigation against the natural hazards of the failure of rains during the later half of monsoon when crops are lost for want of minimum irrigation.
- (8) Input use particularly fertilizer should be increased substantially both in the irrigated areas and dry areas.
- (9) Irrigation facilities should be increased to the possible extent.

#### 5.0 RESOURCE BASE

Gujarat agriculture is essentially dry agriculture. Irrigation potential created by March 1969 was 11.35 per cent of the cultivated area as against 20.7 per cent of the country as a whole. At present only 4.3 per cent of the cultivated area in Gujarat can receive benefit of irrigation using surface water. Without Narmada, Gujarat's potential is assessed as 21.4 per cent against 45.3 per cent of the country as a whole. According to the Irrigation Commission, nearly 1/3 rd of the territorial area and 1/4 th population of the state are within the drought prone zone.

About 53 per cent of the area of the state is under cultivation according to the land utilisation statistics for 1967-68. There is little scope for increasing the area under cultivation except through reclamation of ravines and deserts which is long and costly process and through multiple cropping by increasing irrigation facilities. The gross irrigated cropped area was 2035 thousand hectares which was 19.8% of the gross cropped area.

The levels of input use achieved by the end of the Fourth Five Year Plan were as shown in Appendix 3.

The major part of the weaker section of the society belongs to agricultural sector. The proportion of agricultural labour to the total number of workers works to 22.5 per cent in the whole state. About 48 per cent of the agricultural labourers in the state belong to scheduled castes and scheduled tribes. Of the 22 lakh cultivators in the state, 11 lakhs are those who have below 5 acres each. About 65 per cent of these cultivators may readily fall in the category of marginal farmers and live below subsistence level. Of the 19 districts in Gujarat at least 10 districts have drought prone areas. This in turn brings out the seasonal nature of agriculture and the vagaries to which the cultivators are exposed

#### 6.0 DEVELOPING AGRICULTURAL STRATEGY

In developing the agricultural strategy it is necessary to examine as to what is the achievable rate of growth for the agricultural sector of Gujarat. In order to arrive at the overall growth rate of agricultural sector it is necessary to find out the achievable growth rates of the sub-sectors.

As the major sub-sectors are agricultural production and animal husbandry which together contribute 98% to the SDP of the agricultural sector of the state, it is necessary to disaggregate these sub-sectors and find out the achievable rates of growth at the disaggregate level. Agricultural production is further disaggregated as shown in Appendix 4.

The rates of growth of production and productivity of different crops during the period 1949-50 to 1969-70 were as shown in Appendix 5.

#### 6.1 FOODGRAINS

As the major break-through has been achieved in terms of high yielding variety in bajara which accounts for 43% of total foodgrains production in 1973-74 and 1174 out of 1758 thousand hectares (i.e.67%) have already been covered under HYV, the further rate of growth in this crop would be slower during the Fifth Five Year Plan.

One of the important constraints of the economy is to produce and procure enough food for the weaker section of the society. Based on survey conducted by Bureau of Economics and Statistics of Gujarat on consumption of foodgrains by various sectors in different regions of Gujarat, it is estimated that by the end of the Fifth Five Year Plan at least 22 lakh tonnes of Bajara production would be required to meet the deficit of foodgrains consumption.\*

Assuming the yield rate of 1250 kgs. per hectare in 1978-79 compared to 1088 kgs. per hectare in 1973-74, the area required to be put under Bajara would be 1760 thousand hectares. This would mean that the area under bajara at the end of the Fifth Five Year Plan will have to be kept at the same level as in 1973-74 and the yield will have to be increased from 1088 kgs. per hectare to 1250 kgs. per hectare. It is assumed that the area under other coarse grains: maize, jowar and other cereals would remain at the same level as in 1973-74 but their productivities would be improved as follows :

|               | Yield per hectare (kgs.) |                        |
|---------------|--------------------------|------------------------|
|               | 1973-74                  | Average during 1974-79 |
| Maize         | 498                      | 800                    |
| Jowar         | 433                      | 600                    |
| Other cereals | 1699                     | 1699                   |

As there would be a shift in demand from coarse grains to superior grains there would be some shift in the cropped area towards superior grains. The major shift would be towards the improvement in productivity. It is assumed that the shift in area and productivity would be as follows :

|       | 1973-74              |                          |                        | Average 1974-79      |                         |                              |
|-------|----------------------|--------------------------|------------------------|----------------------|-------------------------|------------------------------|
|       | Area (1000 hectares) | Yield (in kgs./ hectare) | Production ('000 tons) | Area ('000 hectares) | Yield (in kgs/ hectare) | Produc- tion ('000 hectares) |
| Rice  | 456                  | 1018                     | 464                    | 456                  | 1650                    | 752                          |
| Wheat | 500                  | 1656                     | 828                    | 600                  | 2258                    | 1355                         |

Very little attention is paid to development of pulses. From the point of nutritional requirements of protein it is very necessary to develop this source of protein. The productivity of pulses should be raised from 480 kgs./hectare in 1973-74 to 575 kgs./hectare in the Fifth Five Year Plan.

Thus the production level of foodgrains could be raised as follows:

|               | Base level<br>1973-74 |              | Targets<br>1978-79 |              |
|---------------|-----------------------|--------------|--------------------|--------------|
|               | (in thousand tonnes)  |              |                    |              |
|               |                       | %            |                    | %            |
| Rice          | 464                   | 10.5         | 752                | 12.9         |
| Wheat         | 828                   | 18.8         | 1355               | 23.3         |
| Maize         | 132                   | 3.0          | 212                | 3.6          |
| Jowar         | 512                   | 11.6         | 709                | 12.2         |
| Bajara        | 1912                  | 43.5         | 2195               | 37.8         |
| Other cereals | 355                   | 8.1          | 355                | 6.1          |
| Pulses        | 197                   | 4.5          | 236                | 4.1          |
|               | <u>4400</u>           | <u>100.0</u> | <u>5814</u>        | <u>100.0</u> |

This would give 6.43 linear or 5.73 compound rate of growth.

## 6.2 OILSEEDS

Among oil seeds groundnut occupies the most important place. The annual average production figures of oilseeds for the period 1966-71 together with estimated production during 1970-71 are given below :

| Sr. No.        | Crop           | Annual average production 1966-71 ('000 tonnes) | Percentage to total | Estimated production 1970-71 ('000 tonnes) | Percentage to total |
|----------------|----------------|---|---------------------|--|---------------------|
| 1.             | Groundnut      | 1214  | 94.2                | 1836                                       | 94.5                |
| 2.             | Sesamum        | 36  | 2.8                 | 52   | 2.7                 |
| 3.             | Castor         | 23  | 1.8                 | 39   | 2.0                 |
| 4.             | Other oilseeds | 15  | 1.2                 | 16   | 0.8                 |
| Total oilseeds |                | 1288  | 100.0               | 1943                                       | 100.0               |

Gujarat stands first amongst all states in India in area and production of groundnut and accounts for about 20 per cent of the total annual production in the country. The yield per hectare in Gujarat has remained below the all-India average. Although the growth rate of production during the period 1949-50 to 1969-70 was highest (linear 22.36 and compound rate 9.1) among various commodity sub-sectors of agriculture, the growth rate of productivity was the lowest (linear 1.72 and compound rate 1.5). This indicates that the growth rate in production was achieved through the expansion of area.

It is assumed that the production of groundnut is likely to grow if not at the long term compound rate of growth of 9.1 per cent, at least at 5 per cent. This would be achieved by enhancing the productivity. The production of oilseeds would increase from 1778 thousand tonnes to 2269 thousand tonnes.

### 6.3 COTTON

Gujarat produces more than 50% of country's medium staple cotton, nearly 30% of the superior long staple cotton and nearly 59% of extra long staple cotton. Most varieties under long staple and extra long staple cotton are irrigated. The high yielding cotton variety V.797 and Hybrid Cotton.4 have been released recently. The area under Hybrid Cotton.4 is expected to rise to 3 lakh hectares in 1973-74 from .44 lakh hectares in 1969-70. It is expected that the further rise upto 1.25 lakh hectares would take place by the end of the Fifth Plan. The major problem for cotton is improving the productivity of medium staple cotton. Most of this cotton is dry land cotton. Hardly 20 per cent of the area under cotton is irrigated.



The linear rate of growth of cotton for the period 1949-50 to 1969-70 was 9% for production and 3.51 per cent for productivity. Whereas the compound rate of growth was 5.2 per cent for production and 2.8 per cent for productivity. As compared to the performances of foodgrains and oilseeds in the four five year plans, the performance of cotton has been quite steady and encouraging. The production has risen from 8.34 lakh bales (annual average of 1951-55 period) to 15.7 lakh bales for the year 1970-71. In 1971-72 there was a spectacular rise to 22.80 lakh bales and reached 23 lakh bales in 1973-74 (estimated). Even in the abnormal year of 1972-73 the production did not fall as sharply as foodgrains or oilseeds and stayed at the level of 16 lakh bales.

Considering the growth rate of last five years and the emphasis that is required to be put on dry land cotton it would not be difficult to achieve a growth rate of 5% in the Fifth Plan. Even assuming that the area under cotton to remain at the same level in the Fifth Five Year Plan as it was in 1973-74, productivity would rise from 197 kgs. per hectare in 1973-74 to 304 kgs. per hectare in the Fifth Five Year Plan. This would increase the production from 23 lakh bales in 1973-74 to 29.35 lakh bales by the end of the Fifth Five Year Plan.

#### 6.4 SUGARCANE

Although sugarcane does not occupy a sizable area in Gujarat agriculture it contributes substantially to the gross value of agricultural sector. Annual production of sugarcane in terms of gul is expected to reach 2.5 lakh tonnes by the end of the Fourth Plan against 1.66 lakh tonnes in 1968-69. Looking to the perennial irrigation potential to be created during the Fifth Five Year Plan it is expected that the area under sugarcane would rise from 37 thousand hectares during 1973-74 to 80 thousand hectares during 1978-79. The yield is expected to rise from the 6.8 tonnes to 7.50 tonnes per hectare. This would increase the production of sugarcane in terms of gul from 2.5 lakh tonnes by the end of the Fourth Plan to 16 lakh tonnes by the end of the Fifth Plan.

#### 6.5 TOBACCO

Although tobacco does not occupy a substantial area of Gujarat, Gujarat state is one of the leading states in India in respect of tobacco production. The improvement of bidi tobacco has considerably benefitted the cultivators. The research of bidi tobacco which is mainly carried out at Anand has developed improved varieties of bidi and chewing tobacco which have revolutionized per hectare production

of tobacco. The production of tobacco has gone up from about .65 lakh tonnes in 1960-61 to about 1.13 lakh tonnes in 1970-71. The per hectare yield of tobacco has also gone up from 700 kgs. per hectare in 1960-61 to about 1301 in 1970-71. Because of the good research facilities created for bidi tobacco it is expected that better high yielding varieties would be developed fast. The yield per hectare would increase from 1287 kgs. in 1973-74 to 1500 kgs. per hectare during the Fifth Five Year Plan. Most of the bidi tobacco is grown under dry land farming. With the intensive efforts of improvement of dry land farming it is possible that area under bidi tobacco would increase by at least 10% and the area under bidi tobacco would raise from 87 thousand hectares to 95.7 thousand hectares by the end of the Fifth Five Year Plan. This would increase production of tobacco from 107 thousand tonnes to 143 thousand tonnes by the end of the Fifth Five Year Plan.

#### 6.6 FRUITS AND VEGETABLES

Gujarat is on the prime position on the fruit map of India, as famous mango varieties, namely, Alponzo and Kesar are grown in large area in the state. Certain tuber crops like potato and ginger have shown promising results. Considerable stress is to be laid on research work to develop fruit and vegetable production in Gujarat state.

#### 6.7 ANIMAL HUSBANDRY AND DAIRYING

The other major sub-sector of agriculture is animal husbandry and dairying. The gross value of output from the livestock constitutes about 1/5th of the gross value of output from agriculture and livestock put together. The main group which contributes about 4/5ths of the gross value of output from livestock is milk products. The importance of dairying in improving the economy of the small and marginal farmers and agricultural labour is beyond question. Dairying and poultry can provide gainful employment even to the weaker sections of the society.

According to 1972 livestock census (provisional) figures there are 65.36 lakhs cattle and 36.10 lakh buffaloes. The average daily milk yield per animal in milk was 1.67 kgs. for cows and 3.08 kgs. for buffaloes. There are about 3017 thousand poultry and the average yield is 86 eggs per hen. There are 16.52 lakh sheep, the average yield of wool per sheep being 1.08 kgs. The objective of the development of animal husbandry and dairying is to increase the production of livestock products and modernize the processing sector of livestock products. In both these developments emphasis should be put on employment of weaker sections and increasing the contribution of this sector to SDP.

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### 9.1 DEVELOPMENT OF INFRASTRUCTURE

To achieve the targets of agricultural production, animal husbandry, forestry, and fisheries a strategy will have to be developed to provide proper infrastructure and make the essential inputs available to producers to achieve these targets. Infrastructure facilities would include providing facilities for agricultural research, agricultural education, administration, development of irrigation facilities, institutional reforms in land ownerships and tenural relationships, soil conservation and land improvement programmes, creation of warehousing and marketing facilities, livestock improvement programmes, providing facilities of veterinary hospitals and dispensaries, helping establishment of modern dairies, research, education, and training and development programmes in forestry and fisheries.

The Government has taken the responsibility of developing the cooperative structure through which various economic activities can be expanded particularly in the rural economy for effecting improvements in the socio-economic life of the people. The agricultural credit would be provided by the financial institutions, namely, cooperative and commercial banks. The state land development bank is responsible for providing longterm loans for agriculture. The cooperative structure helps cultivators in marketing and processing of agricultural goods. It also helps consumers in the distribution of essential commodities. The infrastructure facilities required for the development of cooperatives is largely supported by the state government. Adequate provision will have to be made for the development of these facilities.

In the rural areas, in addition to the development of economic activities, it is necessary to create conditions which would develop the community as a whole. Special community development programme has been developed. The entire rural area of the state has already been covered under this programme since October 1963. With the inception of the Panchayat Raj in Gujarat from 1st April 1963 the second phase of community development viz. creation and development of democratic institutions at the district, taluk (block) and village levels to take over the responsibility of development has been ushered in. Necessary provisions has to be made in the Fifth Plan for the continuance of the CD programme and also supporting the Panchayat Raj system.

The expenditure on infrastructure facilities required to develop the agricultural sector should have some relationship with the SDP of the agricultural sector. In allocating funds for the Fifth Five Year Plan it would be necessary to assess the investment in infrastructure facilities already created.

## 9.2 DEVELOPMENT OF SPECIAL PROGRAMMES

### 9.2.1 Dry Farming

About 80 per cent of the net cropped area in Gujarat is under dry farming. Failures of monsoon and irregularity in distribution of rain have caused wild fluctuations in agricultural production. The ad hoc expenditure on scarcity programmes drain state budgets heavily. It is necessary, therefore, to do intensive work on dry farming and provide protective irrigation to some part under the dry farming area. Gujarat has been one of the leading states in minor irrigation. The number of irrigation wells is expected to increase from 5.84 lakhs at the end of 1968-69 to 6.10 lakhs at the end of the Fourth Five Year Plan. The number of pumpsets has increased from 1.29 lakhs to 2.09 lakhs during the same period and about 1756 tube-wells are likely to be drilled during the period of the Fourth Five Year Plan. The emphasis in the minor irrigation programmes is to provide irrigation all the year round or at least for the Rabi season. For dry farming what is required is to have well irrigation as a protective measure. At present 8233 thousand hectares are under un-irrigated crops. 928 thousand hectares would be irrigated through various irrigation projects of the Fifth Five Year Plan. If it is desired to provide protective irrigation to 10% of the remaining 7305 thousand hectares it would be necessary to give protective irrigation to at least 730 thousand hectares. If a well can provide protective irrigation to 4 hectares 182 thousand additional wells would be required to be constructed during the Fifth Five Year Plan. This would be equal to the programme of new wells which the Gujarat State Cooperative Land Development Bank had already undertaken during the Fourth Five Year Plan. These wells can be fitted with electrically operated pumpsets or mobile pumpsets could be used to draw water from open dug wells. An organization would be required to be created to manage the use of water drawn from wells for protective purposes. Sprinkler irrigation should be tried particularly in groundnut area where failure of monsoon during the critical period lowers the yield of the crop substantially.

### 9.2.2 DROUGHT PRONE AREA PROGRAMME

The central sector drought prone area programme was taken up for implementation in 41 selected talukas of 10 districts with a view to mitigating the effects of scarcity in drought prone areas. The strategy during the Fifth Five Year Plan would be to evolve integrated area of development programmes with the content of social justice on the basis of resource endowments of these areas. The main elements of strategy include restoration of ecological plans, development and management of irrigation, restructuring of cropping pattern and agronomic practices,

## 9.2 DEVELOPMENT OF SPECIAL PROGRAMMES

### 9.2.1 Dry Farming

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### 9.3.6 Feed and Fodder

The state has at present four cattle feed plants with total installed capacity to handle 550 tons of balanced cattle feed per day. It is proposed to expand the existing cattle feed factories and setting up new cattle feed factories to meet with the growing requirements of cattle feed. The development of fodder programme particularly the green fodder programme is also undertaken.

Having arrived at the physical quantities of agricultural inputs it should not be difficult to fix the state financial outlay to promote the use of these inputs. Adequate credit facilities should be provided through financial institutions to the cultivators.

### 9.4 DEVELOPMENT OF SPECIAL OUTPUT PROGRAMMES

#### 9.4.1 Crop Programmes

Special programmes would have to be developed to bring area under improved varieties of oilseeds and high yielding varieties of dry cotton on the same line as HYV programme for foodgrains. Necessary provision will have to be made for these programmes in the Fifth Five Year Plan.

The research on pulses requires immediate attention. Adequate amount should be provided for this work in the agricultural research programmes and special programmes should be undertaken to popularise improved varieties of pulses.

#### 9.4.2 Livestock Development

A large scale programme of cross-breeding of nondescript cattle as well as Gir and Kankraj with high yielding exotic breeds should be undertaken. Government of India in collaboration with UNICEF and other aid agencies has imported three pure bred lines for crossing and production white Austro chicks. It is proposed to take up the breeding programme on the regional poultry breeding farms at Surat, Ahmedabad, and Junagadh. One thousand Russian marinos have been imported and maintained on the sheep breeding farm at Nalia. State government would locate the exotic rams with the breeders and assist the breeders in maintaining the rams in good condition during the first year.

### 10.0 FINANCIAL OUTLAY

Having fixed the tentative targets, the relationship of development of infrastructure, special programmes, input and output programmes should be established. Based on this relationship the financial outlay of the Fifth Five Year Plan for the Agricultural Sector can be allocated among various programmes and activities.

## Total Gross Value of Output of Principal Crops - Gujarat At Current Prices

| Year     | Total food-grains |      | Cotton(kgs.) |      | Groundnut |      | Tobacco |      | Cotton + groundnut + tobacco |      | All Crops |     |
|----------|-------------------|------|--------------|------|-----------|------|---------|------|------------------------------|------|-----------|-----|
|          | Amount            | %    | Amount       | %    | Amount    | %    | Amount  | %    | Amount                       | %    | Amount    | %   |
| 1960-61  | 98                | 29.7 | 66           | 22.3 | 79        | 26.6 | 10      | 3.4  | 155                          | 52.3 | 296       | 100 |
| 1961-62  | 107               | 31.2 | 72           | 21.0 | 97        | 28.3 | 9       | 2.6  | 178                          | 51.9 | 343       | 100 |
| 1962-63  | 99                | 29.6 | 89           | 26.6 | 74        | 22.1 | 9       | 2.7  | 172                          | 51.3 | 335       | 100 |
| 1963-64  | 139               | 37.6 | 81           | 21.9 | 66        | 17.8 | 10      | 2.7  | 157                          | 42.4 | 370       | 100 |
| 1964-65  | 201               | 39.3 | 97           | 18.9 | 118       | 23.0 | 13      | 2.5  | 228                          | 44.5 | 512       | 100 |
| 1965-66  | 198               | 41.2 | 96           | 20.0 | 84        | 17.5 | 12      | 2.5  | 192                          | 39.9 | 481       | 100 |
| 1966-67  | 240               | 40.5 | 114          | 19.3 | 119       | 20.1 | 14      | 2.4  | 247                          | 41.7 | 592       | 100 |
| 1967-68  | 340               | 46.3 | 105          | 14.3 | 150       | 20.4 | 18      | 21.5 | 273                          | 37.2 | 734       | 100 |
| 1968-69  | 240               | 39.7 | 122          | 20.2 | 105       | 17.4 | 17      | 2.8  | 244                          | 40.4 | 604       | 100 |
| 1969-70* | 289               | 38.9 | 173          | 23.3 | 144       | 19.4 | 21      | 2.8  | 338                          | 45.5 | 743       | 100 |
| 1970-71* | 334               | 34.0 | 219          | 22.8 | 257       | 26.1 | 33      | 3.4  | 509                          | 51.8 | 983       | 100 |

\* Final Forecast



APPENDIX 2

Achievements during the Four Five Year Plans

| Period                   | Foodgrains<br>(in lakh<br>tonnes) | Oilseeds<br>(in lakh<br>tonnes) | Cotton (in<br>lakh bales<br>of 180 kg<br>each) |
|--------------------------|-----------------------------------|---------------------------------|--|
| 1950-51                  | 16.36                             | 4.67                            | 7.32   |
| 1951-55 (Annual average) | 18.75                             | 4.40                            | 8.34   |
| 1956-61 "                | 20.28                             | 11.06                           | 10.55  |
| 1961-66 "                | 25.79                             | 13.58                           | 14.39  |
| 1966-69 "                | 27.43                             | 11.11                           | 14.50  |
| 1969-70                  | 30.90                             | 11.63                           | 15.52  |
| 1970-71                  | 44.06                             | 19.43                           | 15.71  |
| 1971-72                  | 42.20                             | 16.47                           | 22.80  |
| 1972-73 (Anticipated)    | 19.70                             | 4.00                            | 16.00  |
| 1973-74 (Target)         | 44.00                             | 17.78                           | 23.00  |

APPENDIX 3

Input use at the end of Fourth Five Year Plan

Fertilizers

|                              |                   |
|------------------------------|-------------------|
| Nitrogenous (in terms of N)  | 204 thousand tons |
| Phosphate (in terms of Phos) | 86 " "            |
| Potassic (in terms of K)     | 20.8 " "          |

Pesticides

|                |               |
|----------------|---------------|
|                | 1502.2 tonnes |
|                | 1387.6 "      |
| Seed treatment | 23.7 "        |
| Fungicides     | 81.0 "        |
| Others         | 10.5 "        |

Seed

|            |                      |
|------------|----------------------|
| Food crops | 35.0 thousand tonnes |
| Others     | 0.9 " "              |

Tractors

12293

Labour

|   |                       |
|---|-----------------------|
| Cultivators   | 3620 thousand persons |
| Agricultural Labourers  | 1688 " "              |
| Livestock, forestry, fishing,<br>hunting and plantations,<br>orchards and allied activities | 166 " "               |

Soil Conservation

|                                    |                        |
|------------------------------------|------------------------|
| Agricultural lands                 | 1211 thousand hectares |
| Catchment of River Valled Projects | 11 " "                 |

Land Reclamation

40

H Y V (Cereal)

|       |                       |
|-------|-----------------------|
| Paddy | 100 thousand hectares |
| Wheat | 276 " "               |
| Maize | 8 " "                 |
| Jowar | 5 " "                 |
| Bajra | <u>1174</u> " "       |
|       | <u>1562</u> " "       |

APPENDIX 4

Estimates of Gross Value of Output of Principal Crops  
in Gujarat for Target figures of IV Plan at 1968-69  
prices.

| Crop                     | Production<br>'000 tonnes<br>(Base Level<br>1973-74) | 1968-69<br>price per<br>tonne in<br>Rs. | Value in<br>crore<br>Rs. | Percentage<br>to total<br>value |
|--------------------------|--|---|--------------------------|---------------------------------|
| <b>I Food-Grains</b>     |  |   |                          |                                 |
| 1 Rice                   | 464  | 1789                                    | 83                       | 9.7                             |
| 2 Wheat                  | 828  | 971                                     | 80                       | 9.3                             |
| 3 Maize                  | 132  | 689                                     | 9                        | 1.1                             |
| 4 Jowar                  | 512  | 717                                     | 37                       | 4.3                             |
| 5 Bajra                  | 1912   | 814                                     | 156                      | 18.2                            |
| 6 Other cereals          | 355  | 645                                     | 23                       | 2.7                             |
| 7 Pulses                 | 197  | 931                                     | 18                       | 2.1                             |
| <b>Total - I</b>         | <b>4400</b>  | <b>-</b>                                | <b>406</b>               | <b>47.4</b>                     |
| II Sugarcane (gur)       | 250  | 810*                                    | 20                       | 2.3                             |
| III Oilseeds             | 1778   | 1233                                    | 219                      | 25.6                            |
| IV Cotton (lakh bales)   | 23   | 833 Rs<br>per one bale<br>of 180 kgs.   | 192                      | 22.4                            |
| V Tobacco@               | 107  | 1799                                    | 19                       | 2.3                             |
| <b>Total major crops</b> | <b>-</b>   | <b>-</b>                                | <b>856</b>               |                                 |

\* Combined, limited price of sugarcane as such and gur

@ Leaves

APPENDIX 5

Linear and Compound Rates of Growth

| Crop                 | Linear growth rate<br>( per cent) |                   | Compound growth rate<br>(per cent) |                   |
|----------------------|-----------------------------------|-------------------|------------------------------------|-------------------|
|                      | Produc-<br>tion                   | Produc-<br>tivity | Produc-<br>tion                    | Produc-<br>tivity |
| Total foodgrains     | 5.55                              | 6.75              | 3.8                                | 4.3               |
| Total food crops     | 6.06                              | 6.62              | 4.1                                | 3.8               |
| Groundnut            | 22.36                             | 1.72              | 9.1                                | 1.5               |
| Cotton               | 9.00                              | 3.51              | 5.2                                | 2.8               |
| Tobacco              | 9.66                              | 3.70              | 5.9                                | 3.0               |
| Total non-food crops | 10.91                             | 2.72              | 5.9                                | 2.3               |