

**REPORT OF THE COMMITTEE ON
AGRICULTURAL PRODUCTIVITY
IN EASTERN INDIA**

SUMMARY OF RECOMMENDATIONS

RESERVE BANK OF INDIA, BOMBAY

1985

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I - EASTERN INDIA

1. Eastern India comprising West Bengal, Orissa, Bihar and East U.P. is one of the most fertile regions in India. Historically, it was the most prosperous agricultural tract in the country. It lost its preeminence due to a variety of reasons. The region has, however, the necessary potential for achieving a very high level of agricultural productivity. It is endowed with fertile alluvial soils in most parts, good rainfall and abundant surface and groundwater resources and plentiful supply of labour. The recent sluggishness in the growth of agricultural productivity has been caused by a variety of constraints peculiar to the region. Overcoming these constraints deserves the highest priority not only for strengthening the economic base of the nation but also for tackling the very serious social and political problems which result from under and unemployment and acute poverty of the teeming millions of the region who do not have ready access to alternative sources of employment and income.

(Paragraph 1.1.1 - 1.1.4)

2. The solution to the problem of low productivity in agriculture of the Eastern Region lies mainly in intensifying agriculture through advanced techniques of production and development of linkages with modern science and industry.

(Paragraph 2.2.1)

2.

3. Scope for land expansion has now been almost exhausted in the region. Increase in production has, therefore, to be obtained through intensive utilization of land resources.

(Paragraph 2.2.3)

4. In designing programmes for agricultural development of the region, it will be unwise to search for a single set of solutions. This is because physical, structural, institutional, technological, socio-economic and organizational environments which together determine the level of technology vary widely from one area to another.

(Paragraph 2.2.7)

5. As a result of development efforts of recent times, the Eastern Region has now come near the threshold of rapid growth of agricultural productivity. The policy challenge before us is to design a set of development programmes and action plans so that the growth process can gather momentum and propel the region to a higher level of economic activity.

(Paragraphs 2.3.2 - 2.3.3)

6. Implementation of the action programmes set out in this Report will require collective and coordinated efforts and substantial public investment, credit support from the banking system and, more importantly, efficient management. Although the threshold of agricultural breakthrough in Eastern India may now seem near, it may not be crossed so easily. It will need a "big push" in terms of substantial investment and imaginative managerial effort, during the next two plan periods.

(Paragraph 2.3.4)

3.

7. In designing development programmes for Eastern India, the socio-economic characteristics of the region's agrarian economy are often overlooked. The majority of farmers in the region are resource-poor and have little risk bearing capacity. Unless development programmes are directed more towards this group of resource-poor farmers and support and services directly linked with productive cultivation, developmental efforts are not likely to produce the desired result.

(Paragraph 4.6.3)

Strategy for Accelerating Agricultural Growth

8. The basic strategy for inducing intensive agricultural practices in Eastern India has to be through infrastructure development. Unless it is improved through investment of adequate capital on such programmes like micro watershed development, irrigation, flood control, drainage, water management, power, research, extension, input supply, credit, transport, marketing, processing, etc., the scope for technological progress will remain limited.

(Paragraph 5.3.3)

9. In areas with good groundwater potential, the programme for intensive installation of tubewells and pumps to provide appropriate irrigation, drainage and water management may be considered as an important spearhead for facilitating accelerated agricultural development.

(Paragraph 5.3.4)

4.

10. Where water supply is uncertain and inadequate, dry farming on a micro-watershed basis should prove very useful. The spearhead for technological progress in such areas should include, in addition, animal husbandry, fodder, fruit and fuel trees and village industries supplementing crop production.

(Paragraph 5.3.5)

11. At ^amicro-level, efficient Government support will be needed for such special programmes as are to be used as spearheads for development in specific areas and among specific categories of people.

(Paragraph 5.3.6)

12. At micro-level, improved technology will have to be introduced first in a small fraction of the farmer's holding and later extended gradually to other parts as the farmer's skill and resources improve with progressive help from extension, supply, servicing and credit agencies. These latter agencies should relieve the farmer from as much of non-farm work as possible leaving him free to concentrate on farm operations.

(Paragraph 5.3.7)

13. A most critical aspect of agricultural planning for Eastern India is to evoke the will of farm operators to seek sustained growth. This underlines the need for institutional planning focussed on the human factor involved in production process.

(Paragraph 5.4.1)

5.

14. The small farmers' traditional practice of cultivation of a subsistence crop year after year should be modified by helping them to produce some cash crops which require labour-cum-capital intensive cultivation.

(Paragraph 5.5.5)

15. In the policy context, the measures needed for inducing an accelerated agricultural growth in Eastern India broadly fall under the following eight categories ;

(i) Organizational and management coordination in the agricultural sector which has been sadly missing in the eastern region.

(ii) More emphasis on basic technical and scientific principles in the fields of agronomy, farm management and land and water management in the programmes for agricultural reorganization and development especially to improve the productive efficiency of small farms.

(iii) A properly designed water management policy for exploiting the vast irrigation potential of the region, planned exploitation of large groundwater resources, provision of adequate drainage facilities to take out surplus water and micro watershed development wherever possible, should form the key spearheads of development strategy for this region.

(iv) The delivery system for needed inputs, services and credit should be streamlined so as to facilitate increasing use of modern scientific technology. This may be helped by building up a large number of agricultural servicing agencies.

(v) For each relatively homogenous farmers' group, one or two lead technologies should be identified and these should be made attractive enough through a "tapering" scheme of subsidies, where necessary. Once these lead technologies are accepted, complementary technologies will be adopted even if less profitable, and both should take root by the time the subsidy tapers off. If it does not, the subsidy should not be continued but another set of technology should be tried.

(vi) Training and extension programmes are of utmost importance. A simple and general prescription for solving farm production problems will not help. Research, extension and education programmes must recognise diversity and choice.

(vii) Marketing system should be strengthened and should be such that if facilities ^a ~~for~~ disposal of small surpluses by a large number of farmers at remunerative prices. The market emerges as a logical focus of activities. It should be utilized for developing a large number of evenly spread growth centres in rural areas.

(viii) Special programmes with as much production thrust as possible must be designed for those specific areas and people not benefiting from the general production-oriented development programmes.

(Paragraphs 5.7.1 - 5.7.9)

Prospects for Accelerating Agricultural Growth

16. Two possible alternative levels of agricultural development during the Seventh and Eighth Plan periods have been envisaged. The two alternatives of the development pattern are based on a careful assessment of the eastern region's production potential, the current

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trends in its agricultural development programmes and the recommended strategies. They provide broad dimensions of the "push" that would be needed in terms of inputs, technologies and practices for propelling Eastern India to progressively higher growth paths.

(Paragraphs 6.1.1 - 6.1.2)

17. According to our Estimate I, agricultural productivity for the region as a whole is likely to exhibit an annual growth rate of about 3 per cent per annum during the Seventh Plan and a little over 3.5 per cent during the Eighth Plan. Agricultural production is likely to grow at an annual compound rate of 6 per cent during the Seventh Plan and a little over 4.5 per cent during the Eighth Plan.

(Paragraph 6.4.4)

18. According to our Estimate II, the annual growth in agricultural productivity will be around 2 per cent and 3 per cent during the Seventh and Eighth Plan periods, respectively. Under this estimate, agricultural production is likely to increase at the rate of nearly 4 per cent per annum during the Seventh Plan and a little less than 4 per cent per annum during the Eighth Plan. Thus, the annual increase in production would range between 4 - 6 per cent during the Seventh Plan and 4 - 5 per cent during the Eighth Plan.

(Paragraph 6.4.4)

19. From a purely technological standpoint, even the high growth rate given by us may appear to be an under-estimate. But not only supply constraints, but also demand constraints need to be taken into

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consideration. On the other hand, agricultural production as a whole (although not of every crop) may substantially exceed even our higher estimate, if both the production and demand constraints are successfully overcome. At the stage of foodgrains production that the country has now reached, total agricultural production should receive even greater attention than merely the production of cereals.

(Paragraph 6.4.5)

Management and Organization

20. For extensive operations, we have no alternative but to depend largely upon Government functionaries and cooperatives, use private sector for providing useful competition and much needed flexibility and voluntary organizations for developing 'models' for emulation. Government regulation and control may be kept ready but used as a last resort and for limited periods only.

(Paragraph 7.1.2)

21. Competition among all the alternative agencies should be encouraged. Monopoly of any agency, public or private, is not desirable.

(Paragraph 7.1.3)

22. For covering the large mass of rural population, Government functionaries have necessarily to play a leading role. This would call for a substantial improvement in management and organization. Greater attention should be paid to (i) eliminating inefficiency, inertia, dishonesty and avoidable wastage of scarce resources and

(ii) promoting motivation and enthusiasm for implementing programmes. There must be better coordination amongst the various departments.

(Paragraph 7.2.1)

23. Without a strong administrative leadership, all efforts at development will not produce the desired result. All concerned must take steps to nurture this and further nothing should be done to undermine this. The authority and prestige of Departmental Heads at the State level and Government functionaries at the District/Block level should not be eroded if they are to deliver the goods expected of them.

(Paragraph 7.2.2)

24. The working of Agro-Industries Corporations is not satisfactory. These Corporations must concentrate on manufacture and sale of machinery and implements, improve their custom and hire services, particularly to small and marginal farmers, and open more repair and service centres. They should give up the business of distribution of inputs which seems to make them neglect their main task.

(Paragraph 7.3.1)

25. The Agro-Industries Corporations should be made to run on business lines. If this is not possible within a reasonable period of time, they should be wound up and the requisite services made available departmentally. The private sector should also be utilised to a larger extent than hitherto and permitted to compete with the public sector agencies.

(Paragraph 7.3.2)

26. Minor Irrigation Development/Water Development Corporations should be drastically reorganized to be efficient and financially viable. Trained management/technical experts only should be appointed as Managing Directors of such corporations on a performance contract basis, which should include suitable reward and penalty.

(Paragraph 7.3.3)

27. State Governments should undertake periodic review of the working of public sector Corporations and adopt appropriate measures to improve their working.

(Paragraph 7.3.4)

28. The State Governments should take effective steps to tackle the problem of theft and the tampering of electric installations.

(Paragraph 7.4.1)

29. For agricultural purposes, the provision of separate power lines should be given priority. The farmers should be assured of an uninterrupted supply for specific hours in a day alongwith a rotation system of power supply during forenoon and afternoon, as in Tamil Nadu.

(Paragraph 7.4.2)

30. In some interior areas, farmers face problems of uncertain supply of diesel oil for pumpsets. The distribution machinery in such areas should be improved. The "franchise" system followed by oil companies for petrol stations to provide supplies and services to their customers in urban areas could, with some modification, be usefully

extended to their potential customers in rural areas.

(Paragraph 7.4.3)

31. Panchayat Samitis and Zilla Parishads can play a useful role in rural development. If these institutions are to be effective in promoting rural development, there should be greater contact and coordination between them and the Agriculture and other concerned Departments.

(Paragraphs 7.6.1 & 7.6.3)

32. Cooperatives have not fared well in Eastern India. They have to be made to work better if the farmers of this region, bulk of whom are small and marginal, have to improve their productivity and standard of living.

(Paragraph 7.7.1)

33. For certain purposes, e.g., credit or supply, there is need ^{for} ~~to~~ a minimum critical size and cooperatives have necessarily to be somewhat large. If there are economies of large-scale operations, there are also serious diseconomies. There is a need in the case of such cooperatives for the State Governments to arrange for careful monitoring and take effective action whenever necessary to curb malpractices or to protect the interest of the weaker sections.

No large cooperative or federation of cooperatives should be allowed to exercise monopoly power. There are, however, other functions, e.g., sharing of tubewells, machines or vehicles or joint marketing or even joint farming in which small cooperatives or associations or even groups can work quite efficiently, if they comprise like-minded

members with common interest. State Governments should mount a special campaign to promote such functional cooperatives. All such functional cooperatives and groups should be given preferential treatment for Government assistance and bank credit.

(Paragraphs 7.7.4 to 7.7.7)

34. It is necessary to encourage voluntary organizations to get involved to a substantially larger extent than at present in the agricultural development process and provide adequate help to genuine and dedicated organizations. At present, many of the voluntary organizations depend heavily on foreign donations. It is necessary that adequate flow of financial assistance should come to voluntary organizations from Indian sources. Additional tax concessions will help increase private donations. NABARD and commercial banks, who have separate "Research and Development" (R&D) funds, may provide some seed money and overhead cost on a grant basis out of their R & D Funds and project cost as loans to deserving voluntary organizations, after appropriate evaluation by an expert committee. Government may also provide some grant and loan assistance, preferably for specific programmes and projects. Special safeguards should be provided to keep out political influence and bureaucratic interference as these will very adversely affect the credibility and efficiency of these organizations. Voluntary organizations themselves should consider becoming members of some Coordinating Association of their own, which can take up the task of imposing on them certain standards of financial accountability and ethical conduct.

(Paragraphs 7.8.2, 7.8.3,
7.8.5, 7.8.6 & 7.8.7)

35. State Governments should consider inviting reputed industrial Corporations, business firms, banks, etc., each to adopt a secondary market and 2 or 3 villages near it for undertaking experiments in development of agriculture and related industries in rural areas of Eastern India. Some infrastructure facilities or other assistance may be provided to them.

(Paragraph 7.9.2)

36. Lack of coordination among various departments is a serious constraint affecting agricultural development. To improve inter-departmental coordination, the status of APC should be raised above the level of Departmental Secretaries. Alternatively the function of coordination should be entrusted to the Chief Secretary or Additional Chief Secretary. At the district level, the District Magistrate should be Chairman of a Committee entrusted with the full responsibility for coordinating the work of the concerned government departments at the district level, with the senior most Agricultural Officer as the Convenor.

(Paragraphs 7.10.1 and 7.10.2)

37. While implementing the programmes, it is important to ensure proper sequencing of actions by the concerned departments. Without effective sequential link-up, it will not be possible for farmers to derive optimum benefit from the programmes implemented.

(Paragraph 7.10.3)

38. Budgetary procedures have to be suitably modified to provide for some free funds for agriculture at the State level. A similar flexibility will be helpful at the district level also.

(Paragraphs 7.11.1 and 7.11.2)

39. Subsidies should not be given as 'investment subsidy' initially as hitherto, but linked with performance. There is also a good case for gradually moving away from the system of general and continuing subsidies, wherever practicable to a system of tapering subsidy for limited periods ^{of} ~~in~~ initiation, tailor made for specific target groups.

(Paragraph 7.11.4)

40. For coordination and monitoring the implementation of our recommendations, we suggest the appointment of two Committees at the State level. One Committee will be presided over by the Chief Minister with all concerned Ministers as members. The second Committee will be presided over by the Chief Secretary with Secretaries of all concerned Departments including Planning and Finance as members. Representatives of the Union Ministry of Agriculture, RBI and NABARD should be invited to attend the meetings of both the Committees. The APC may be the convenor of both these Committees.

(Paragraph 7.12.1)

41. Monitoring and Evaluation Cell should be set up within the State Government.

(Paragraph 7.13.1)

42. To oversee the implementation of programmes, a Coordinating Committee may be set up at the Union Ministry of Agriculture, consisting of Secretaries of Ministries of Agriculture, Irrigation and Finance and representatives of Planning Commission, PBI and NABARD.

(Paragraph 7.13.2)

43. The policies and procedures should be so designed as to meet the felt and emerging needs of farmers, especially the resource-poor among them. The basic approach should be to work with the farmers than just to work for them. Sound human relations and effective two-way exchange of experiences should be given high priority. The key word in this context should be "innovative management" of all relevant factors of production to maximise per ha and per capita productivity.

(Paragraphs 7.14.1 & 7.14.2)

Land and Farm Policy

44. The salient features of the approach to the problems of small farms are the following :

- (i) to accept the small farm as inescapable part of the agrarian structure.
- (ii) to provide all the needed supplies (of equipment and inputs) and services to farmers through other agencies, viz., public agencies, cooperatives, voluntary organizations and private enterprises on a non-monopolistic and competitive basis.

- (iii) to enable the farmer to concentrate on the specialised job of farming with efficient services from these other agencies for providing all the complementary and supplementary jobs that need to be done on a custom service, rental or a hire purchase basis as far as possible.
- (iv) to arrange timely and adequate credit from banks or cooperatives to pay for these services and supplies, and
- (v) to provide the needed transport, storage, marketing and processing facilities.

(Paragraph 8.2.4)

45. Consolidation of holdings should be given a high priority, especially in irrigated areas and areas with good groundwater potential. A pilot project for consolidation should be taken up in suitable areas in each district. Consolidation of holdings should be combined with on-farm development (OFD) works. Adequate funds for this purpose should be earmarked in the State Plans.

(Paragraph 8.2.5(i))

46. Beneficiary Groups or Associations should be formed for joint operations like sharing of wells, tanks, micro-watersheds, pumps, machinery transport, storage etc.

(Paragraph 8.2.5(ii))

47. Small farmers having 2 standard ha or less of land should be exempted from the present tenancy legislation and permitted to lease out and lease in land freely.

(Paragraph 8.2.5(iii))

48. A "floor" limit for operational holdings should be fixed. The operational holding should not be allowed to fall below say, $\frac{1}{2}$ or 1 standard ha. The land reform law and, if necessary, the relevant succession law should be amended to put a floor limit. Heirs may be given options to

- (a) sell or lease their shares below $\frac{1}{2}$ or 1 ha to a co-sharer or an adjacent farmer,
- (b) form a joint-farming group, or
- (c) sell or lease the holding to an agency designated by the Government.

Necessary term loans may be made available by the State Land Development Bank or an agency designated by the Government for purchase of such lands wherever necessary.

(Paragraph 8.2.5(iv))

49. All the constraints, big or small, need to be identified at different levels, viz., village, block, agro-climatic zone and State. Corrective action should be taken up in a systematic manner by the State Governments, with the support of all other institutions and service Agencies. The financial resources required to overcome the more crucial constraints have to be estimated from block level upwards.

(Paragraphs 8.3.1 and 8.3.2)

50. Crop planning can be flexible in areas irrigated by shallow tubewells and pumpsets, because the farmer can exercise control over supply of water. However, in canal irrigated areas, the cropping pattern depends on the time and volume of water released and

therefore the control of farmers over water is limited. Lands which are not suitable for rice should be sown to low duty crops requiring less water. This will help in providing irrigation water to a larger area. The concept of crop planning, on a pipe outlet basis needs to be introduced backed by research in location-specific high-yielding and high stability varieties of crops and improved agricultural practices.

(Paragraph 8.3.3)

51. In areas with high variability of rainfall, suitable contingency plan should be prepared, taking into account the pattern of rainfall at the time of sowing and crucial periods of plant growth.

(Paragraph 8.3.4)

52. Poor and marginal lands not suitable for rice should be utilised for raising millets (wherever possible), fodder crops (wherever they can be profitably introduced to support mixed farming) and fuel trees.

(Paragraph 8.3.6)

53. A large part of the cropped area in Eastern India is rainfed. The Centrally Sponsored Scheme of Micro-watershed Development should be supplemented by State Government efforts. National Rural Employment Programme (NREP) could be utilised with advantage for construction of micro-watersheds.

(Paragraph 8.3.7)

54. A Central Scheme should be taken up for control of soil erosion in catchment areas which cuts across state boundaries. Afforestation and agroforestry should also be taken up on a large scale to control soil erosion.

(Paragraphs 8.4.2 and 8.4.3)

55. In alluvial plains, maximisation of production of staple crops, especially HYVs in medium/large holdings, and HYVs/high value crops in small holdings should be encouraged. In areas where water supply is inadequate, low-duty crops, agro-forestry, orchards and mixed farming, should be tried and where the land is undulating, micro-watershed development will be useful. In hilly, terai and plateau regions, the main focus of development should be agro-forestry, horticulture crops and fuel trees supplemented by animal husbandry and other allied activities. For utilising wasteland not fit for crop production, suitable species of fodder, fuel and fruit trees should be identified for each area.

(Paragraphs 8.5.2 8.5.4)

56. In coastal saline areas, improvement of drainage, measures for soil amelioration and prevention of salt water intrusion should get high priority. Research and field trials on salt-tolerant crops which can stand different degrees of waterlogging need to be taken up.

(Paragraph 8.5.5)

57. Medium and large farmers should be encouraged to allocate as much of their holdings as possible for the cultivation of HYVs of staple crops like rice and wheat. In small farms, where there is

assured irrigation and which have access to motorable roads, farmers should be encouraged to raise on a part of their holdings high-value crops and/or HYVs of staple crops. This will help improve their incomes. As their resources improve, these farmers will be able to increase, step by step, area devoted to such crops.

(Paragraph 8.6.1)

58. There should be a special effort to introduce intensive "gardening" type of operations as against the less intensive agricultural type of operations in small farms. Modern gardening tools and scientific gardening technology should be introduced for this purpose. The farmers should be helped in the process by provision of minikits of seeds and fertilizers and extension support. The objective of gardening type of farming will be to help secure at least one main crop in kharif season with rain water and at least one main crop and one or two other crops in the rabi/summer seasons primarily with canal, riverlift or ground water. An attempt should, thus, be made to maximise the gross sown area per holding through multiple cropping and increase yield per unit of sown area through careful land preparation and weeding, good water management, use of seeds of HYV or HV crops, scientific fertilization and plant protection measures.

(Paragraphs 8.6.2 and 8.6.4)

59. Modern machinery and gardening tools should prove very helpful, after suitable adaptation, for more efficient use of family labour and maintenance of crop production in bulk of the small farms of Eastern India.

(Paragraph 8.6.5)

60. The choice of high value crops to be raised will vary from area to area, depending on soil, agroclimatic factors and more importantly marketing possibilities. To facilitate marketing of perishable crops such as fruits and vegetables, standardisation of such crops/products on a compact area basis should be encouraged. The strategy of promoting high value crops such as vegetables can produce good results only if there are effective links between production and marketing.

(Paragraph 8.6.7)

61. The strategy of extending high-yielding or high-income production ~~by~~ multiple cropping based on sound water management and gardening type of operations in Eastern India will call for substantial changes in the existing infrastructure for research, extension, irrigation and drainage. Besides, steps will have to be taken to overcome demand constraints. Due attention will have to be paid to strengthening the systems for input supply, output marketing and credit flows.

(Paragraph 8.6.8)

62. Along with cultivation of high-value crops, the small and marginal farmers should be encouraged to take up supplementary activities such as animal husbandry, particularly in tribal and backward areas.

(Paragraph 8.6.9)

63. Where transport facilities are inadequate, farmers should be encouraged to produce non-perishable crops.

(Paragraph 8.6.11)

64. It is neither necessary nor feasible to cover a small farm fully at one go by labour-cum-capital intensive technology. It may be better, to start with, if a fraction of such farm is covered by this new technology, the other part being confined to traditional farming. As the skill, confidence and capacity of the farmer improve and more capital becomes available with augmentation of infrastructural support, the rest of the farm may be covered step by step.

(Paragraph 8.6.14)

65. State Governments should promote manufacture of improved implements through both Government agencies like Agro-Industries Corporations and private enterprises.

(Paragraph 8.7.4)

66. The Government of India should consider setting up a Central Institute for Small Tools for Eastern India for design, research and development of small tools and implements suitable to the region.

(Paragraph 8.7.5)

67. In regard to costly machinery and implements which cannot be individually owned by farmers, especially small farmers, the following options are open :

- i) Local progressive farmers who could buy a few of the more costly items and share with other farmers on a rental basis should be encouraged to set up agro-service centres.
- ii) Co-operatives, Farmers' Groups or Associations may be encouraged to own such assets to be utilised on a sharing basis.
- iii) Leasing agencies/companies, both in public and private sector, may be set up to hold stocks of machinery, implements, etc., for hiring out to farmers.

(Paragraph 8.7.6)

68. Selected manufacturers, who satisfy ISI standards or produce goods of reputed quality and have a good record of service and big enough operational capability, may be encouraged to adopt specified "clusters" or "compact areas" for giving "franchise" to local entrepreneurs for implements hiring, servicing and repair stations on the model of oil companies' petrol stations.

(Paragraph 8.7.10)

69. A healthy competition between Government agencies, co-operatives and private enterprises should be deliberately promoted.

(Paragraph 8.7.11)

70. To provide comprehensive services and supplies to farmers, the setting up of agroservice centres by progressive farmers, private entrepreneurs or Government agencies should be specially encouraged by State Governments. No single agency should have a monopoly in this sphere.

(Paragraphs 8.8.1 and 8.8.2)

71. The need for creation of adequate employment opportunities in non-farm sector will require, effective linkages to be created between agricultural and non-agricultural sectors through a planned development of servicing, supplying, marketing and processing industries/enterprises in the secondary markets and other potential industry centres, to start with, and then spread further in the hinterland. Supply of adequate power, transport and communication network, provision of factory sites and water supply on concessional terms and provision of adequate marketing and banking facilities in such centres are essential pre-conditions for promoting the setting up of such industries. In this connection, fiscal and other concessions analogous to those now made available to new industries in no-industry districts should be extended to new medium scale industries in no-industry blocks.

(Paragraphs 8.9.1 and 8.9.2)

72. The setting up of such medium scale industries/enterprises should be encouraged in Blocks 50 kms or more distant from an existing industrial centre, so as to provide, on a suitably dispersed basis, employment opportunities to farm labourers who wish to seek nonfarm employment.

(Paragraph 8.9.3)

73. The tribal areas require special attention. Agroforestry, horticultural crops, and the raising of fruit trees and animal husbandry should be the focus of development in tribal areas.

(Paragraph 8.10.1)

74. Farmers, particularly small farmers, should concentrate on making the optimum use of land and labour for improving productivity both per ha and per capita. All inputs like water, seeds, fertilizers, pesticides, production requisites like implements, pumps, pipes, power tillers and other machinery, and technical services for agronomic, horticultural and animal husbandry operations, etc., should be provided to them in time and in adequate measures by other agencies having special competence in these on convenient payment terms, e.g. instalment payment, renting or custom service. Adequate credit for the purpose should be provided by the cooperatives and banks both to farmers and agencies providing such inputs and services.

(Paragraphs 8.11.1, 8.11.2 and 8.11.3)

75. Division of labour rather than self-sufficiency, renting and hiring rather than ownership, labour-cum-capital intensive technology rather than primarily labour-intensive farming, step by step increase in the proportion of high value crops by small farmers, development of transport and marketing facilities and small and medium industries in secondary markets and other growth centres in the countryside to siphon off excess labour in the farm sector are the key elements in our strategy for development in Eastern India.

(Paragraph 8.11.4)

Irrigation, Drainage and Water Management

76. Considering the vagaries of rainfall in Eastern India, the main thrust of development strategy has to be in the domain of irrigation, drainage and water management.

(Paragraph 9.1.1)

77. Optimum water management can be helped by

- (i) ascertaining the frequency of wet and dry days during the monsoon period and evapo-transpiration especially in sowing and maturing periods of staple crops, for better crops and contingency planning;
- (ii) sinking batteries of shallow and deep tubewells as appropriate in compact areas (a) powered by electricity, if uninterrupted for at least 8 hours per day and (b) powered by diesel in other areas;
- (iii) constructing dugwells, river lifts, and tapping of water from tanks, rivers, streams, jheals, etc.
- (iv) providing in each block sufficient number of light weight diesel pumps which can be carried by carts to help (a) efficient use of water from river, canals, tanks, wells, etc., for irrigation and (b) drain out excess water in waterlogged areas;
- (v) modernising canal systems with adequate provision for control structures and appropriately regulating release of water;
- (vi) constructing well laid-out field channels and drains with suitable provision for their periodic maintenance;

- (vii) making adequate provision for drainage channels both in irrigated and unirrigated areas to take away surplus water to neighbouring depressions ~~of~~^{by} rivers where water levels are lower during critical periods;
- (viii) diverting new irrigation channels, as far as practicable, to "dark" and "grey" areas with a view to augmenting surface irrigation and recharging groundwater regimen; and
- (ix) revising periodically delineation of areas into "white", "dark" and "grey" from the groundwater standpoint.

(Paragraph 9.2.1)

78. The State Governments should aim at maximum possible exploitation of groundwater in "white" areas. In "grey" areas, the objective should be utilization of this source to the extent it can be economically exploited. In "dark" areas, these resources should be tapped to the extent technically safe and feasible on the basis of careful surveys for the conjunctive use with surface water and rainfall. Different spacing norms should be applied in "white", "grey" and "dark" areas.

(Paragraph 9.3.2)

79. Compact areas with good groundwater potential in "white" and "grey" areas should be covered intensively by shallow tubewells and pumpsets, either electric or diesel. In selected compact areas with good groundwater potential, "batteries" of tubewell bores should be sunk by the State Governments under a 100 per cent Centrally Sponsored Scheme, in a phased manner and according to a rough "grids" to

facilitate, inter alia, power supply. The cost of sinking tubewell bores and providing electric connections in the case of electric pumpsets on farmers' fields may be met fully under the Scheme by the Central Government in view of the national importance of early utilisation of the vast groundwater potential of the region.

(Paragraphs 9.3.4, 9.3.6 and 9.3.7)

80. For pumpsets, farmers will have the following options :

- (i) purchase individually with or without bank finance;
- (ii) share the pump with other farmers in a Group or Association, the cost of which could be financed by banks under a preferential Group Loan Scheme;
- (iii) hire-in from leasing companies, agro-service centres, cooperatives or panchayats, etc. Lease charges may be met by farmers out of short-term loans from banks/cooperative societies. Leasing Companies/agencies may be given medium/long term loans by banks on attractive terms. Present acreage and other restrictions regarding provision of credit for tubewells and pumps should be suitably relaxed.

(Paragraph 9.3.8)

81. The sinking of tubewell bores on particular plots should be subject to such obligations from the owners and other beneficiaries that (a) they will purchase the pumpset, share with others or hire from an appropriate agency, and (b) they will not obstruct water conveyance to adjacent plots.

(Paragraph 9.3.10)

82. If the farmers are unable to set up and manage pumpsets, the task may be entrusted by the Government on a contract basis, to a cooperative, a voluntary organization or a private enterprise after acquiring the site.

(Paragraph 9.3.11)

83. In blocks, where none of these alternatives work, Government may finance the full cost of bores and pumps and charge appropriate water rate, taking care that it does not become cheaper than in the other alternatives.

(Paragraph 9.3.12)

84. For electric pumpsets, in compact areas, dedicated lines should be laid so that uninterrupted power supply is assured for at least 8 hours a day. Where it is not possible to do so, a rotational system of power distribution should be introduced, as in Tamil Nadu.

(Paragraph 9.3.13)

85. In villages not electrified, or where uncertainty of power supply persists, a programme of installation of diesel pumpsets should be taken up on a similar basis. In view of better assurance regarding diesel supply, they have an edge over electric pumpsets in this region. Further, they have also the added advantage of greater mobility. Light weight diesel pumps can be transported by carts. Carts can also be utilised for carrying rolls of PVC pipes in addition to pumps for water conveyance. Banks should finance farmers for purchase of carts, pumps and pipes, with refinance ^{from} ~~for~~ NABARD.

(Paragraph 9.3.14)

86. For diesel pumpsets, oil companies should arrange for properly equipped diesel sale and service stations on "franchise" basis in rural areas on the model of what they are doing now for petrol sale and service stations in urban areas.

(Paragraph 9.3.15)

87. To improve utility and economics of diesel engines/electric motors and to provide additional income, they should be usable for both water-lifting and agro-processing activities such as flourmaking ("Chakki" operations) within prescribed limits.

(Paragraph 9.3.16)

88. The selling of water and hiring out diesel pumpsets by owners of tubewells and pumpsets should be encouraged.

(Paragraph 9.3.17)

89. In each block one public sector agency and at least one large enough private sector company may be encouraged to operate as "leasing agency/company" for electric motors and diesel pumpsets (of ISI standard or specifications approved by a State Level Technical Committee), rolls of plastic pipes and other ancillary equipment. Pumpsets, which should be easily detachable and separately insured, may be purchased and kept in stock by the leasing agency/company. Since the pumpsets will be detachable, the threat that they may be taken away on non-payment of lease rent should be reasonably effective for timely payment of dues by farmers.

(Paragraphs 9.3.18 and 9.3.19)

90. Leasing agencies should be in a position to stock a large number of motors, pumps and other ancillary equipment. They may be granted, if need be, bank loans on concessional terms. NABARD may work out the details of terms and conditions of such bank loans.

(Paragraph 9.3.21)

91. In selected areas, the State Governments should undertake a planned and suitably subsidised programme for construction of dugwells. This may be taken up as a 100 per cent Centrally Sponsored Scheme. In the construction of these dugwells, NREP and PLEGP could be involved.

(Paragraph 9.3.24)

92. NABARD has been considering the introduction of a "failed well compensation scheme". NABARD should take steps for its early introduction in consultation with Government of India and State Governments.

(Paragraph 9.3.25)

93. Water and electricity, two important inputs for crop production in tubewell areas are optimally utilised if rates for their use are charged on a volumetric basis. In the case of water, this can be done by charging rates on a per hour/crop basis. In regard to electricity, its use can be regulated through a meter charging the consumer on the basis of actual power consumed. The guiding principles for determining water and electricity charges for irrigation and power should be such that (i) it is related to actual consumption, (ii) it should not lead to overuse of available

water resources and (iii) the farmer should not be charged for the period when there is no supply.

(Paragraph 9.3.26)

94. The objective in regard to deep tubewells should be (a) improvement in the functioning of existing tubewells and (b) a cautious approach ⁱⁿ ~~for~~ the construction of new deep tubewells.

(Paragraph 9.3.27)

95. In areas suitable for deep tubewells, their construction as well as laying down of channels should be taken up by the Government. But their management should be entrusted on a contract basis to Beneficiary Farmer Groups/Associations, Committee of Beneficiaries, private entrepreneurs or voluntary organisations, as may be appropriate.

(Paragraph 9.3.28)

96. The prevailing water rates are unduly low. They need to be reviewed and restructured on the basis of the value of service principle. Water rates may be fixed on the basis of hours of supply or volume of water supplied. The State Governments may also consider introduction of differential rates for deep tubewells-basic water rate for the kharif season and a basic plus additional water rate for the rabi season.

(Paragraph 9.3.31)

97. Next to groundwater exploitation, modernisation of canal systems should receive high priority in this region. Major works like new dams north of the Ganga may be deferred for a few years. The objective

should be to complete the ongoing projects. New medium surface irrigation projects should be taken up mainly in areas which are "dark" and "grey" from the groundwater standpoint.

(Paragraph 9.4.2)

98. The Chairman, CADA, the Engineer-in-Charge of the project and the senior most agricultural Officer of the region must meet frequently and discuss and decide issues relating to the release of water and closure of canal according to water requirements of crops in the command areas. The State Level Standing Committee of Officials recommended in Chapter 7 should ensure this and provide overall co-ordination.

(Paragraph 9.4.4)

99. Water requirements of crops should be carefully studied for each pipe outlet and arrangements made for timely supply of water.

(Paragraph 9.4.5)

100. Steps should be taken for a progressive expansion of command area under the "warabandi" (rotational water supply).

(Paragraph 9.4.6)

101. Construction work on field channels and drains needs to be stepped up in all irrigation projects. There is a need for the State Governments to have the necessary legislative powers for carrying out construction of field channels in the entire command area including plots of unwilling farmers.

(Paragraphs 9.4.8 and 9.4.9)

102. Water rates charged for canal irrigation at present are too low. Water rates should be raised step by step to the level of economic water rates. To discourage excessive use of water, a two-part tariff system should be introduced. Leaders of public opinion should be requested to educate the people about the harmful effects of unduly low irrigation rates.

(Paragraphs 9.4.11 to 9.4.13)

103. Operational manuals for reservoir management should be prepared wherever such manuals do not exist in consultation with the Central Water Commission (CWC). To improve the working of reservoirs not operating efficiently, comprehensive studies should be undertaken by the CWC.

(Paragraphs 9.4.15 and 9.4.16)

104. Before undertaking construction of very costly high storage dams in the Himalayan region, the technical feasibility and economic viability of tapping very deep aquifers (1500 metres or deeper) that are supposed to exist in East U.P., Bihar and West Bengal, through artesian wells or very deep tubewells may be explored.

(Paragraph 9.4.17)

105. Conjunctive use of water can be promoted in the command areas of major and medium irrigation systems through a programme of sinking tubewells and enforcing suitable water rates and "warabandi".

(Paragraph 9.4.18)

106. Tanks can provide a useful source of irrigation to farmers. The State Governments may undertake renovation of old tanks and construction of new ones utilising NREP and PLEGP. Their maintenance should be vested with Panchayats or Farmers' Groups. Legislation should be undertaken to enable the State Governments to take over water rights in tanks, jheels and lakes and entrust their management to these bodies.

(Paragraph 9.5.1)

107. Adequate funds should be allotted to complete the distribution channels of river lifts so that optimum benefits can be derived from them.

(Paragraph 9.5.2)

108. The management of the river lifts may be entrusted to a Committee of Beneficiaries, Voluntary Organisations, or private entrepreneurs, on a contract basis, as in the case of deep tubewells.

(Paragraph 9.5.3)

109. In undulated and steep topography with light and permeable soil and where water is scarce, sprinkler or drip irrigation is useful.

(Paragraph 9.5.5)

110. There is also good scope for bullock-driven and manually operated water lifting devices. State Governments should encourage R&D efforts by Agricultural Universities and enterprising private entrepreneurs to develop improved human or bullock operated water lifting devices, which are less costly and can utilise the surplus labour available in rural areas.

(Paragraph 9.5.6)

111. For hilly areas, minor irrigation structures such as check bunds, Kolhapur weirs, Mandi type pipe systems, etc., should be considered. Hydrams are also well suited for lifting water in hilly areas.

(Paragraph 9.5.7)

112. Micro-water sheds should be developed in drought-prone areas as a high priority measure. By the end of the Seventh Plan, all drought-prone districts should be covered with micro-watershed development programme.

(Paragraph 9.6.1)

113. A comprehensive Master Plan for drainage should be prepared by the State Governments, in collaboration with the Government of India and implemented as a time-bound programme covering both irrigated and unirrigated areas. The Master Plan should cover on priority basis areas susceptible to waterlogging due to heavy rainfall.

(Paragraph 9.7.6)

114. For undertaking drainage works, a lumpsum allocation of Rs.600 crores may be earmarked during seventh Plan and Rs.700 crores in Eighth Plan for Eastern India under a Central Sponsored Scheme.

(Paragraph 9.7.7)

115. Construction of intermediate drainage channels should be taken up by the State Governments. NREP and RLEGP can be usefully utilised for the purpose.

(Paragraph 9.7.8)

116. CADA and State Irrigation Departments should initially bear the full cost of construction of field drains and recover it from farmers through enhanced water rates. Government of India should make available to CADA/State Irrigation Departments loans to enable them to undertake these works. In the meanwhile, provision for minor irrigation per block under Special Programme for Small and Marginal Farmers may be made available for minor drainage as well. The allocation of Rs.3.5 lakhs per block may be raised by Rs.1 lakh in flood-prone blocks.

(Paragraph 9.7.9)

117. At present, the State Irrigation Department is responsible for drainage works only in irrigated areas. It should be equally responsible for all areas and redesignated as Department of Irrigation, Drainage and Water Management.

(Paragraph 9.7.10)

118. To contain the impact of floods a Master Plan on river basin basis needs to be prepared and suitable flood control measures taken up. For achieving inter-state coordination, Master Plans and suitable action programmes should be chalked out jointly by Government of India and State Governments. The relevant recommendations of Flood Commission should be implemented expeditiously.

(Paragraph 9.8.2)

119. State Governments should take steps to build up an effective contingency plan for areas and crops which are prone to suffer from floods. Necessary stocks of seeds and nurseries of short-duration varieties should be kept in readiness for distribution in cyclone and flood-affected areas.

(Paragraphs 9.8.3 and 9.9.1)

120. There is a strong case, in the national interest, for treating the programmes for batteries of tubewells on compact area basis, dugwells in selected areas, modernisation of canals, construction of drainage works (including additional bridges, culverts and siphons needed) and micro-watershed development as 100 per cent Centrally Sponsored Schemes.

(Paragraph 9.10.2)

Input Supply

121. The State Governments should take steps to augment production capacities of the Seed Corporations in regard to certified seeds. At the same time, the agricultural universities should augment the production of breeder and foundation seeds.

(Paragraph 10.2.3)

122. The seed certification agency should issue necessary certification to seeds produced by "Registered Growers" and "Contract Farmers" after ensuring that they conform to the minimum standards of quality. The Seed Corporations should make adequate arrangements to buy such seeds from farmers.

(Paragraph 10.2.4)

123. Seed Corporations are not functioning satisfactorily. A case by case study of these Corporations should be undertaken by the Union Ministry of Agriculture.

(Paragraph 10.2.5)

124. The region has to depend entirely on outside sources for meeting its seed requirements in respect of wheat, potato, jute, etc. The State Governments should make necessary arrangements for their timely procurement and distribution to farmers.

(Paragraph 10.2.6)

125. The region is faced with a shortage of seeds/planting material in respect of vegetables, fruits and plantation crops. The production of seeds/planting material for horticulture and plantation crops of standardised varieties should be stepped up in areas where agro-climatic conditions are suitable for their cultivation.

(Paragraph 10.2.7)

126. The State Governments should take steps to distribute new and improved varieties of seeds at frequent intervals.

(Paragraph 10.2.9)

127. A phased programme of expansion of retail outlets should be taken up so that by the end of the Seventh Plan, every Panchayat will have at least one sale centre.

(Paragraph 10.2.8)

128. For promoting the use of quality seeds, State Governments should provide facilities for exchange of certified seeds with grains produced by farmers and lay down appropriate barter terms for such exchange.

(Paragraph 10.2.12)

129. Seeds are not given high enough priority in railway wagon allotments. Since seeds have to be transported quickly and at short notice, delay in wagon allotment causes serious losses in production. Hence, Railways should give priority in wagon allotment for seeds next to defence.

(Paragraph 10.2.13)

130. A phased programme for covering all Panchayats with distribution centres for fertilizers should be taken up by the State Governments during the Seventh Plan.

(Paragraph 10.3.1)

131. At present, fertilizers are delivered at the block at fixed prices. Distances from Block to village vary and cost of transportation is high in interior and hilly areas. There is, therefore, a case for permitting transport charges beyond block level to be added to the price in some areas.

(Paragraph 10.3.3)

132. In tribal areas, LUMPS have to serve far flung areas. The margin on fertilizers is not adequate to meet the distribution costs. Hence, certain villages in each tribal block may be declared as "Block Headquarters" for the purpose of issue of fertilizers at the pool price

(Paragraph 10.3.4)

133. To suit the requirements of small and marginal farmers as also to reduce the possibilities of adulteration when sold loose, supply of sealed packets of 10 to 20 kg. should be arranged. In areas growing predominantly vegetables, small packets of 5 kg. should be made available to small and marginal farmers.

(Paragraph 10.3.5)

134. The State Governments should arrange for periodical testing of soil samples and suggest appropriate fertiliser dosages. Efforts should also be made to identify areas suffering from deficiency of dolomite and micronutrients like boron, zinc etc. Suitable soil amendment measures should be taken.

(Paragraph 10.3.6)

135. Use of organic manures and compost derived from plant residues, agricultural wastes and byproducts should be encouraged by educating the farmers about their value.

(Paragraph 10.3.7)

136. Cultures of bacterial and other bio-fertilizers should be developed and distributed to farmers. The cost of maintaining and multiplying these cultures should initially be borne in full by the Government of India.

(Paragraph 10.3.7)

137. To keep watch over attack of pests and diseases, there should be a surveillance unit in each Division.

(Paragraph 10.4.2)

138. Only pesticides packed in small tamper-proof containers with appropriate directions should be allowed to be sold by dealers.

(Paragraph 10.4.4)

139. Banks and PACS/LAMPS should provide credit to small cultivators for purchase of spraying instruments. Private dealers/leasing companies should also be encouraged to hire out sprayers.

(Paragraph 10.4.6)

140. The State Departments of Agriculture should nominate the District Agricultural Officer as the Vigilance Officer, who should periodically check the stocks of seeds, fertilizers and pesticides maintained by private dealers. If malpractices are detected the dealers should be punished suitably.

(Paragraph 10.5.1)

141. Besides the use of HYVs of seeds and chemical fertilizers, there are a number of non-monetary measures that could be taken up by farmers for increasing productivity. The main practices which could help increase productivity are timely sowing optimum seed rate, maintenance of optimum plant population, nursery treatment, better water management, weed control, need-based plant protection measures and appropriate doses of fertilisation.

(Paragraph 10.6.1)

142. Organic farming approach as advocated and practised by some voluntary organizations, like Vikas Maitri of Bihar, deserves favourable consideration.

(Paragraph 10.6.2)

Agricultural Research, Extension and Training

143. The attitude and approach of the research scientists need to be tempered with a mission to be fulfilled. It will be useful if each of them is required every year to present before a disciplinewise seminar a paper, explaining his research findings in the previous year and research programme for the next year.

(Paragraph 11.1.2)

144. At least one research station should be located in each agro-climatic zone supported by substations or verification and testing stations. Each zonal station should have two wings, one for research on staple crops and the other for highvalue crops. Where it is not possible for one research station to accommodate two wings, a second research station might be set up for high value crops.

(Paragraph 11.2.2)

145. Where, in uplands, the average rainfall is 1000 mm and above, rice and another crop on residual moisture can be grown. Where the average rainfall is between 800 and 1000 mm, rice is risky, but inter-cropping with pulses/oilseeds is advisable, so that in case rice fails, the second crop will survive. Water harvesting techniques are strongly recommended to provide protective irrigation. Line sowing instead of the usual broadcast seeding ensures good stand of paddy and high yield.

(Paragraph 11.3.3(i))

146. Rainfed lowlands commonly suffer from excessive moisture, waterlogging and inadequate drainage. Submergence causes poor stand of paddy, poor tillering, iron toxicity. Drainage improvement will

obviously reduce adverse effects of waterlogging and flood. Some deep water (50 cm) paddy varieties are known. The seeds of these varieties should be made available to farmers. Supergranules of urea are found to be quite efficient even under deep water conditions.

(Paragraph 11.3.3(ii))

147. Irrigated medium lands are capable of giving high yields under good management and irrigation.

(Paragraph 11.3.3(iii))

148. The answer to the problem of poor crop growth in saline soils is to have salt tolerant crops. Prevention of salt water inundation by embankments/dykes is an obvious choice but this measure should be taken in consultation with the Department of Irrigation and Drainage.

(Paragraph 11.3.3(iv))

149. Suitable pest and disease resistant varieties of rice and varieties capable of withstanding some amount of water stress, deep water and salt are yet to be evolved to suit such adverse situations as are met in this region. These areas of research will have to find a place in the Seventh Plan proposals for rice research in the country.

(Paragraph 11.4.1)

150. In regard to other Crops, effective research effort is needed in the direction of evolving varieties of crops which would respond to the various climatic situations. The varieties may not necessarily be high yielding but should be stable medium yielding ones.

(Paragraph 11.4.2)

151. Research is needed for evolving standardised high yielding varieties of fruits, spices, vegetables and flowers that have large demand potential both for export and domestic urban markets and are suitable for different agro-climatic zones. This is necessary to facilitate large scale marketing and better price realisation by the producer.

(Paragraph 11.4.3)

152. Research on how best to tackle surplus and deficit of water caused by erratic rains should receive the highest priority. Research is also necessary in irrigation procedures and water management aspects.

(Paragraph 11.4.5)

153. Techniques for water harvesting and conservation need to be made an integral part of crop husbandry of the region.

(Paragraph 11.4.6)

154. The areas that need attention in terms of both applied and adaptive research to support crop husbandry may be summarised as follows:

- (i) identification of specially uncertain rainfall weeks in the sowing and flowering periods of important crops, area by area, and introduction or development of varieties or alternative crops which can withstand this uncertainty or avoid these weeks, on the basis of detailed study of rainfall and evapotranspiration data for each area.
- (ii) development and introduction of short duration or cash crops of high value;

- (iii) methods of application of nitrogenous fertilizers in different forms (coated, supergranules, etc.) to rice at various levels of submergence for the purpose of increasing their use efficiency;
- (iv) amelioration of micronutrient deficiencies in different areas;
- (v) evolving cost effective engineering structures in the water distribution system;
- (vi) reclamation of alkaline and saline soils;
- (vii) evolution and introduction of salt tolerant varieties of crops;
- (viii) crop planning and land-use planning.

(Paragraph 11.4.8)

155. The designing of improved implements, tools, and machinery which could be operated by local bullocks and human power is imperative. Agricultural engineers should also think of adapting suitable implements, etc., in use under similar farm situations in other countries like Taiwan, South Korea, Philippines, Israel and Japan.

(Paragraph 11.4.12)

156. The development of prototypes suited to Eastern India has been ^a rather slow process. Agricultural Universities, Regional Research Centres, IITs, Regional Engineering Colleges, etc., should step up this effort. Private entrepreneurs and voluntary organizations who might be willing, should be helped in their research and development effort with suitable funding from banks and the Government. A Central Institute of Agricultural Engineering Research should be

set up in the region to look into the specific problems of Eastern India and to adapt improved machinery and implements available elsewhere to the needs of the region.

(Paragraph 11.4.14)

157. As an incentive, a large enough prize (say Rs.1 lakh) should be announced and national recognition should be given periodically to research workers and entrepreneurs who design and/or develop improved prototypes of implements/tools/carts, etc. which prove their worth in field trails. NABARD may consider taking a lead in this matter.

(Paragraph 11.4.15)

158. There is need for preparing comprehensive inventories of research findings which, though relevant to agriculture of the region, are not yet in use on a large scale on the field. In preparing such inventories it is necessary to draw upon the research findings not only of the Agricultural Universities and other research institutes functioning in the Region, but also those of research institutes in other parts of the country and international institutes which are working on problems of agro-climatic situations similar to those obtaining in the region.

(Paragraph 11.5.1)

159. The Universities and State Governments should collaborate with international research institutes, like AVRDC, Taiwan and IRRI, the Philippines and list and utilize the research findings as are ready for extension in a phased manner.

(Paragraph 11.5.3)

160. The results of research already available on shelf can help in substantially increasing agricultural productivity in Eastern India, provided they are effectively transferred to the farmers' fields by adaptive research and extension efforts.

(Paragraph 11.6.1)

161. The reasons for non-adoption of technologies approved by adaptive research stations should be investigated by the agricultural universities in collaboration with State Governments and remedial measures taken. This kind of scrutiny needs to be done for each agro-climatic zone separately in respect of (i) staple crops, (ii) high value crops, (iii) improved practices in crop production, (iv) animal husbandry/fisheries, and (v) improved implements and machinery. Adequate funds should be provided to the Department of Agriculture for speedy implementation of the recommendations.

(Paragraph 11.6.2)

162. The T&V system should be extended to East U.P. as early as possible.

(Paragraph 11.6.4)

163. The complement of Sub-division Level SMS Group is laid down on a uniform basis for a State. The composition of these Groups needs to be tuned to the local requirements. Disciplines like horticulture, agroforestry, dry farming, which are not represented at present should be included where necessary. Further, water management is an important discipline for Eastern India and a specialist in this area should be provided for.

(Paragraph 11.6.5)

164. The Compact Area Programme in Orissa under which inputs and management practices are made available in a compact area at farmer's door steps under close supervision of carefully selected field functionaries with a minimum yield guarantee to the farmers has produced good results in raising productivity. This approach is worth emulation by other States of the Region.

(Paragraph 11.6.8)

165. With a view to providing motivation to VAWs suitable selection grade/promotional avenues should be provided for in-service rules. They may be provided in service training and facilities of higher study to upgrade their professional qualifications.

(Paragraph 11.6.10)

166. It has proved difficult to wean extension and research staff away from generalised type of recommendations and high input and high cost technology. Extension service should become increasingly aware of this problem and take remedial measures within its own operations. In particular, extension functionaries must exert pressure on the research scientists to reorient their research priorities according to field requirements.

(Paragraph 11.6.12)

167. There is need for a strong linkage between the input and credit delivery system and the extension agency to realise the full benefit from the technology which is sought to be extended. The complement of staff available with the Block Development Officer should look after this function and might, if necessary, be strengthened.

(Paragraph 11.6.13)

168. A selected number of contact farmers may be utilised on payment of suitable remuneration, as assistants to VAWs, designating them AVAWs or Krishi Pracharakas, in areas where the number of holdings is too large for the existing VAW to cope with single-handed. The AVAWs could apply themselves to extension work on traditional crops and simpler practices, leaving the VAW free for extension work on new and high value crops and products and more sophisticated practices.

(Paragraph 11.6.14)

169. Besides strengthening the present departmental extension organisation in the States, there is need for simultaneously developing specialised supplementary lines for additional support for the strategy for diversifying production recommended by us. These activities include, inter alia :

- (i) supporting and encouraging the small/marginal farmers to take up mixed farming and/or cultivation of high value crops on even a fraction of their holdings. Where possible they may combine fish culture and duckery with rice production;
- (ii) Promoting livestock development, fodder production and agroforestry, especially in tribal and backward areas;
- (iii) Promoting round the year production of legumes and other nutritious food in kitchen gardens for domestic consumption;
- (iv) encouraging fisheries development in tanks and waterlogged areas not suitable for crop production.

(Paragraph 11.6.16)

170. Voluntary organizations and corporate agencies interested in agricultural development of the region can be very helpful in undertaking innovative experiments and providing models to emulate. They should be given necessary encouragement and support.

(Paragraph 11.6.16)

171. Experts in horticulture and animal husbandry in the Government or in other institutions, who have recently retired and are in good health and are prepared to work in difficult tribal and backward areas, may be usefully inducted as extension consultants in these difficult areas.

(Paragraph 11.6.19)

172. To improve the professional competence of the extension functionaries, adequate pre-service and in-service specialised refresher training courses should be organized at different levels.

(Paragraph 11.6.20)

173. Rural television programmes need special attention and priority now that the television coverage is rapidly expanding into rural areas. The programmes should be designed to advise the farmers on specific farm operations at periodical intervals. The training courses given to the VAWs fortnightly under the Training and Visit programmes should also be broadcast through the mass media for wider dissemination.

(Paragraph 11.6.22)

174. Pilot programmes should be taken up in all the four States of the region for conveying extension message to farmers in selected villages with the help of films or video-tapes. Video Cassette players may be used in villages where there is no television coverage.

(Paragraph 11.6.23)

175. A centre may be set up in each State to prepare Video Cassettes or films based on fortnightly training capsules for VAWS for wider transmission.

(Paragraph 11.6.23)

176. Exposure to demonstrations, farm melas etc. of groups of farmers is another method of farmers' training. Visits of farmers from backward areas to progressive areas/States for witnessing the actual working of modern farm technologies have a salutary effect on farmers.

(Paragraph 11.6.25)

177. For effecting interchange of experience, annual seminars should be conducted jointly by Agricultural Universities and State Agricultural Departments with the participation of SMS, experts and progressive farmers at District and State levels.

(Paragraph 11.7.2)

178. Collaboration between the Government Departments and Universities would be of help in upgrading the quality of research work as well as extension performance. This will involve deputation of university research scientists to adaptive research stations and the posting of researchers working in these stations to the universities. Attractive deputation terms and financial assistance should be provided for this purpose.

(Paragraph 11.7.3)

179. Senior scientists of agricultural universities/research institutes may visit adaptive research stations and field demonstration plots as often as possible and meet farmers to appreciate their problems.

(Paragraph 11.7.5)

180. It is necessary to train and deploy the M & E units set up for proper assessment of the impact of extension and various development programmes as also to provide feedback for any correction which may be needed, in this regard.

(Paragraph 11.8.1)

181. Special care needs to be taken to ensure that the research and extension staff work closely with representative groups of "resource-poor" farmers.

(Paragraph 11.9.1)

182. The basic problems of the target group of farmers should be first discussed with them, thereafter research effort should be specifically focussed on these and the results discussed once again with the target group. Socio-economic aspects of the problems faced by the target group should receive no less attention than the technological aspects.

(Paragraph 11.9.1)

Marketing Development

183. It is important to ensure that there would be effective demand for crops produced. Otherwise the production programmes will suffer adversely for want of marketing outlets. Demand constraints can inhibit agricultural productivity no less than production constraints.

(Paragraph 12.1.1)

184. In years of bumper harvest, the State Governments should be prepared for procurement operations on a selective basis to ensure reasonable prices to farmers. States should keep ready suitable contingency arrangements for such procurement, through the Central and State procurement agencies.

(Paragraph 12.1.2)

185. For perishable crops like fruits and vegetables, price-support arrangements may not be easy to operate. For such crops there is no alternative but to organise a strong marketing and cold storage infrastructure, quick and effective transport facilities to alternative markets and timely advice to farmers in regard to adjustment of production to emerging demand patterns.

(Paragraph 12.1.3)

186. All markets - rural, assembling, wholesale and terminal - need to be brought under the purview of the Agricultural Produce Markets Acts and regulated according to a time-bound programme. The coverage of Central Schemes to develop regulated markets and rural markets needs to be improved.

(Paragraph 12.2.3)

187. Steps should be taken to organise effective market committees in all regulated markets with due representation of both traders and producers, including small farmers.

(Paragraph 12.2.5)

188. Each State should have a full-fledged Directorate of Agricultural Marketing.

(Paragraph 12.2.8)

189. The setting up of Watch Groups consisting of market functionaries, local experts and representatives of farmers and the trade at all principal markets to monitor prices and marketing arrangements regularly in respect of all major marketed commodities should be helpful.

(Paragraph 12.2.11)

190. The large number of dormant cooperative societies and the low volume of business handled by the societies underline the need for an in-depth review of the working of State Cooperative Marketing Federation and marketing societies by the Registrar of Co-operative Societies and appropriate remedial measures taken on the basis of such a review.

(Paragraph 12.3.7)

191. There is a need for co-operative marketing societies to make arrangements for purchase of goods at village sites.

(Paragraph 12.3.8)

192. Several agro-climatic zones of the region, viz., Darjeeling District in West Bengal and hilly areas of Bihar and Orissa have a rich potential for development of orchards. Provided marketing could be developed, a large variety of fruits, vegetables, spices, medicinal plants and flowers could be grown in the region.

(Paragraph 12.5.1)

193. For facilitating marketing, production of standardised varieties of such commodities in popular demand should be organised in suitable compact areas. The necessary adaptive research and

extension effort should be mounted in each agro-climatic zone backed by an effective input supply system.

(Paragraph 12.5.2)

194. On account of the perishable character of horticultural products and growth of semi monopolistic trading rings, special marketing arrangements are necessary. An integrated approach is needed towards the entire gamut of production, collection, transport, storage, processing and marketing of this group of commodities, preferably in the framework of a producer-oriented cooperative system.

(Paragraph 12.5.4)

195. Each of the four States of the eastern region should set-up a Horticulture Marketing and Processing Company, if necessary, as a joint venture with the private sector. This will help better organization and management in processing and marketing of fruits and vegetables, both in domestic markets and abroad.

(Paragraph 12.5.7)

196. The 'project' approach tried in Himachal Pradesh and recently extended to Jammu and Kashmir for development of horticulture should be considered by the State Governments of the eastern region for replication with suitable modifications.

(Paragraph 12.5.8)

197. There is considerable scope for production of flowers in demand abroad like rose, tuberose, gladioli in Eastern India in suitably identified compact areas. The nature of this demand is, however, sophisticated and stringent standards of quality have

to be met. A beginning to take advantage of this demand needs to be made on a well planned and adequately financed manner.

(Paragraph 12.5.9)

198. All villages need to be connected through link roads, negotiable at least by bullock carts, to nearest motorable roads. Access to motorable roads and through them to the marketing points is an important pre-requisite for developing production of perishable crops on compact area basis. There should be adequate financial provision for maintenance of village roads so that these do not become unserviceable during rainy season.

(Paragraphs 12.6.3 and 12.6.4)

199. There is special need for developing improved types of bullock carts, suitable for the draft power and size of local animals, as also of cycle rickshaw/thelas.

(Paragraph 12.6.5)

200. Rural entrepreneurs not fully employed in agricultural activity should be encouraged through suitable credit facilities, to acquire standardised transport vehicles like carts, cycles, rickshaws, tempos, mini-trucks, etc. at reasonable prices. Side by side, adequate arrangements for servicing such vehicles should be also built-up.

(Paragraph 12.6.7)

201. It is necessary to take special measures to ensure availability to farmers of adequate storage facilities as also credit against the hypothecation of stocks. The procedures for marketing of produce

hypothecated with the banks also need to be simplified. Measures to improve the negotiability of warehouse receipts need to be taken.

(Paragraphs 12.7.3 and 12.7.4)

202. Public sector agencies like the National Horticulture Board should have a programme for provision of cold storages in producing areas and marketing centres. Facilities for processing and preservation of perishables like fruits and vegetables should also be provided at selected marketing centres to avoid wastage in peak periods of production. Private sector enterprise should also be encouraged to play a constructive competitive role in this regard.

(Paragraph 12.8.3)

203. The promotion of rural industry centres, especially in the secondary markets to start with and a more even spread, particularly of medium scale industries in rural areas, needs to be pursued in a purposive manner.

(Paragraph 12.9.1)

Agricultural Development in Tribal Areas

204. In formulating a planning strategy for tribal areas, their special features must be recognised.

(Paragraph 13.2.1)

205. On the basis of level of socio-economic development, the tribals can be grouped into four major categories, viz. (a) primitive tribals living mostly in isolated and inaccessible areas and practising primitive agriculture, (b) shifting cultivators, somewhat more advanced than the primitive class and engaged in slash-and-burn

method of cultivation, (c) tribal communities which are in transition and have taken to settled agriculture and are in process of acculturation and (d) acculturated communities who are living in the vicinity of the industrial and mining complexes.

(Paragraph 13.3.2)

206. Primitive tribals live in inaccessible areas and their main source of livelihood is hunting and gathering of fruits, tubers and fuel wood. Only the officers of Forest Department are in touch with them and any programme to help them has to be implemented through that Department. Forest Officers need to be specially oriented and provided necessary resources if such tribals are to be helped.

(Paragraph 13.3.3)

207. The labour-intensive technology which is currently being emphasized in the non-tribal areas of this region is not often suitable for the first two categories of tribals, although it may have some use for the third category. Introduction of labour saving technology after suitable adaptation, may prove more appropriate and help modernise their outlook and increase their income, provided it remains under their own control and is not used by outsiders to exploit them. Utilisation of community organizations, which are strong among tribals, and banning of contractors should be a key element of this approach.

(Paragraph 13.3.6)

208. Financial institutions need to modify their approach and procedures substantially and make them simpler to overcome special problems of tribals. If they need some assistance for this purpose that should be provided by Government. The fact that tribals are usually very honest and particular about debt repayment should be given special consideration. Those, who pay interest regularly, should be given adequate extension of time for repayment of principal, when needed. Usual penalties for default may be relaxed in the case of tribals.

(Paragraph 13.3.9)

209. Due to poverty and illiteracy, the tribal farmers are not in a position to make use of improved technology. Attempts to impose such technology on them without proper care may prove even counter-productive. The technology to be introduced must take into account their skill endowments as well as resources. There is, therefore, need for special adaptive research stations in tribal areas which can adapt or develop suitable technology for use by the tribals.

(Paragraph 13.3.10)

210. As tribals are not able to take risks and are slow to assimilate new skills and attitudes within a short period, a step by step introduction of improved technology would show better results than massive introduction of modern technology. Use of non-monetary ~~monetary~~ inputs available in tribal areas should be encouraged.

(Paragraph 13.4.2)

211. For promotion of suitable technology for tribal areas, adaptive research stations set up in tribal areas should conduct regular field trials on various programmes, and also perform 'lab-to-land' experiments. Only tested and tried programmes and practices should be introduced. Any failure can seriously impair the confidence of the tribal community in the change-agent.

(Paragraph 13.4.3)

212. It may not be possible to stop shifting cultivation altogether in the near future due to various reasons. However, some steps can be taken to protect the soil from erosion. Tribals should be persuaded to plant some fruit trees on the bunds and not to burn or cut them at the time of shifting. Since tribals usually hold fruit trees as sacred, this should not be difficult.

(Paragraph 13.4.4)

213. The task of improvement of land under shifting or jhum cultivation can be entrusted with advantage to a separate corporation.

(Paragraph 13.4.5)

214. In tribal regions, area under irrigation is negligible. Therefore, more emphasis should be put on dry farming practices.

(Paragraph 13.4.6)

215. Projects for micro-watershed development would show good results in many tribal areas and should be given high priority.

(Paragraph 13.4.7)

216. Development of irrigation facilities in tribal areas would improve crop intensity. Therefore, high priority should be accorded to minor irrigation in any programme for tribal development.

(Paragraph 13.4.8)

217. In command areas of big irrigation projects, many tribals are not able to take the benefit of the project because their land is not developed or they are not in a position to invest for construction of field channels, etc. It is, therefore, necessary that land shaping and development should be an integral part of irrigation projects in tribal areas.

(Paragraph 13.4.11)

218. For making full use of irrigation facilities in tribal areas, much more extension support is necessary than in other areas.

(Paragraph 13.4.12)

219. In marginal and sub-marginal lands and areas affected by acute soil erosion, soil fertility is very low. In these areas, fruit, fodder and fuel plants should be grown to provide better avenues of income to tribals.

(Paragraph 13.4.13)

220. While developing horticulture or vegetable cultivation in tribal areas, a standard variety should be encouraged at one place. This facilitates marketing.

(Paragraph 13.4.14)

221. In some areas, there is potential for poultry, piggery, rearing rabbits, sheep-rearing, goatery, cattle breeding, dairy and pisciculture. Tribals seem to prefer meat animals to milk animals and this needs to be kept in view. Development of these and allied activities would help improve the socio-economic conditions of tribals.

(Paragraph 13.5.1)

222. Women play an important role in tribal areas and need to be drawn in a significant way in the training programmes for tribal areas. From this standpoint, the programme adopted in Madhya Pradesh for training young tribal couples, seems to be more effective and useful and may be introduced in Eastern India.

(Paragraph 13.6.1)

223. Increased flow of institutional finance is one of the most important inputs required for improving agricultural productivity. There should be special provision for credit for production and non-production (consumption) purposes through either the existing banking structure suitably oriented. Procedures for credit disbursement should be simple. The voucher system should be introduced. Each tribal borrower should be given loan pass book and/or Vikas Patrika which would have all entries of loan disbursement and repayments. This would reduce the possibility of exploitation of tribals by officials or middlemen.

(Paragraphs 13.7.1 and 13.7.2)

224. For tribal areas, a special institution i.e. Large-sized Adivasi Multi-Purpose Society (LAMPS) has been set up. Usually, tribal areas are hilly and sparsely populated. Unless there are sufficient number of LAMPS, they would not be able to serve efficiently all the tribals concerned. Where the number of LAMPS cannot be suitably increased, the existing LAMPS should be provided with banking-cum-input supply motor vans (with four wheel drive where necessary) so that tribals attending weekly haats can be reached and serviced during the haat days at least. Alternatively branches may be set up in outlying areas. Some of the programmes and procedures of Grameen Banks of Bangladesh may be usefully adopted in tribal areas.

(Paragraph 13.7.⁵1)

225. For meeting the increasing demand of tribal areas, LAMPS should have enough resources. For this purpose LAMPS should have a line of credit with the District Central Banks supplemented, if necessary, by line of credit from commercial banks.

(Paragraph 13.7.6)

226. The LAMPS should be given a special subsidy for transportation of inputs and outputs initially. As the volume of business increases, this subsidy can be reduced.

(Paragraph 13.7.7)

227. There is need for a plan to develop all local haat locations as rural industry centres within the next 5 to 10 years.

(Paragraph 13.7.10)

228. Most of the tribals still carry the produce on head loads. Institutional credit for purchase of a bullock cart or cycle rickshaw can reduce the drudgery. Government should give adequate subsidy for this purpose in tribal areas. Banks should also provide credit for the purpose.

(Paragraph 13.8.1)

229. Procurement of minor forest produce from tribals is a major function of LAMP5. For this, they should have linkage with regional, State or National apex organisations.

(Paragraph 13.8.2)

230. Any value addition to forest produce can increase the income of tribal people considerably.

(Paragraph 13.8.3)

231. Tribals can play an important role in forest development. Large areas in Chhotanagpur Plateau as well as Orissa have been lying barren which can be allotted to tribals for the development of social forestry as in Gujarat or 'farm' or Agro-forestry as in Rajasthan.

(Paragraph 13.9.1)

232. The implementation of various developmental programmes in tribal areas would depend on a dedicated and efficient cadre of Government servants. Liberal allowances and on the job promotion opportunities, if necessary, have to be granted to attract and retain really good people in these difficult areas. Care should be taken not to post in tribal areas, officials belonging to a caste or community generally considered exploiters by the local tribals.

(Paragraph 13.9.2)

233. For supplementing the regular Government staff, services of some experienced retired technical officers, especially in horticulture and animal husbandry could be also usefully utilised as advisers. To avoid bureaucratic problems, they may be attached to a local voluntary organisation, with assured cooperation from the block authorities. They should be paid an attractive honorarium by Government through the Voluntary Organization, in addition to their pension.

(Paragraph 13.9.3)

234. Voluntary organizations can play more effective role than Government agencies as they are not subject to rigidities of rules and regulations and are more flexible to meet local requirements. The State Governments should, therefore, encourage and also provide necessary help to genuine and dedicated voluntary organisations.

(Paragraph 13.10.1)

235. Involvement of tribals at grass roots level in formulation and implementation of various developmental programme would also accelerate the pace of development. Representative tribal organisations at village level can serve as useful intermediaries which can identify the genuine needs and difficulties of tribals, provide help in formulation of suitable thrust for development and build up pressure against exploitation.

(Paragraph 13.10.3)

236. There is need for special radio, television and video cassette programmes dealing with the problems faced by the tribals regarding agriculture and related subjects. These may be designed at units specially set up for the purpose and disseminated through community sets.

(Paragraph 13.10.5)

237. It will be useful if at least once each year officers of agriculture, horticulture, animal husbandry, irrigation and drainage, transport and cooperative departments meet the knowledgeable representatives of tribals and Voluntary Organizations in each tribal district in a seminar to discuss freely and frankly the problems faced, solutions tried and results obtained.

(Paragraph 13.10.6)

238. Development of the right kind of human relationship is the key to the development of tribals. Mere technological and economic approaches would not be enough. These are necessary but must be supplemented by anthropological and socio-psychological approach. Government agencies, voluntary organisations and research institutes should collaborate closely towards this end.

(Paragraph 13.11.3)

Animal Husbandry and Fishery Development

239. In the context of the small farmer dominated economy of Eastern India and given its rich potential, development of animal husbandry and fisheries can play a vital role in raising productivity per capita and improving the socio-economic conditions of the rural poor. It will also help to provide subsidiary foods such as milk, meat, eggs and fish to improve the nutritional standards of the people.

(Paragraph 14.1.1)

240. With the adoption of improved methods of breeding and feeding, health care of animals, and proper management, productivity increase and along with it the socio-economic betterment of weaker sections can be brought about. The small and marginal farmers should, therefore, be given facilities to take up mixed farming.

(Paragraph 14.2.4)

241. The present development strategy emphasises breeding and disease control, but fodder production is neglected. The Agricultural Departments should be made responsible for extension and input support for fodder production, as recommended by NCA. Only then will fodder get its due importance in the cropping pattern.

(Paragraphs 14.2.5 and 14.2.6)

242. Development programmes in the animal husbandry sector should be organised as far as possible in the framework of producer-oriented cooperative marketing system.

(Paragraph 14.2.7)

243. The artificial insemination programme, which is likely to be of substantial benefit to a very large number of marginal farmers and landless labourers, should be given much greater attention and resources than is being done today. The present tendency of some veterinary officers to give higher ^{Priority} ~~priorities~~ to distribution of milch animals needs to be controlled.

(Paragraph 14.2.10)

244. Considerable efforts are needed to improve the milk production capacity of ~~earth~~^{cattle} by undertaking cross-breeding programmes. The efforts made by the breeding centres under ICDP and operation Flood II are not satisfactory. These centres need strengthening. The budget provision for these purposes need to be augmented.

(Paragraph 14.3.2)

245. The availability of good quality breeding buffalo bulls in the region, for natural service is inadequate. Steps may be taken to increase their number.

(Paragraph 14.3.3)

246. NABARD's scheme for rearing of cross bred heifers and for financing cattle breeders to increase number of good quality animals needs to be widely undertaken in the region.

(Paragraph 14.3.5)

247. There is a need to conserve the surplus green fodder which is available in the monsoon season, in the form of dried hay or as silage which could be used during scarcity period, like summer months. Chaffing of fodders to reduce wastage is also necessary.

(Paragraph 14.3.6)

248. The diagnostic service centres in the region are not satisfactory. These will have to be strengthened.

(Paragraph 14.3.7)

249. The existing milk marketing arrangements are inadequate and unorganised. The existing milk handling capacities are also low. The dairy cooperatives are either inefficient or mostly defunct. Steps are required to be taken to improve these shortcomings.

(Paragraph 14.3.8)

250. State Governments need to take steps to strengthen the infrastructure for poultry development and supply of inputs by organizing primary producers' cooperative societies/units and Poultry Development Corporations at the State level.

(Paragraph 14.4.3)

251. Development of improved strains of poultry should receive greater attention.

(Paragraph 14.4.4)

252. Efforts may be made to improve concentrate ^{feed} ~~food~~ capacities.

(Paragraph 14.4.5)

253. Steps should be taken to introduce cross-bred breeds of sheep to improve the quality and quantity of wool and meat production.

(Paragraph 14.5.2)

254. There is a need to introduce improved stall-fed varieties of goats, which will help improve milk and meat production.

(Paragraph 14.5.4)

255. There is need for taking up intensive breeding-cum-marketing schemes in piggery.

(Paragraph 14.6.1)

256. Development efforts are necessary to augment both inland and marine fishery on scientific lines. It is important to promote relevant technologies of production processing and marketing in both these sectors to ensure availability of fish for local consumption as well as to enable realisation of remunerative prices by fishermen. Export of prawns and other high-priced marine products should be a major consideration in our strategy. These efforts will help improve the socio-economic wellbeing of fishermen.

(Paragraph 14.7.2)

257. Many waterlogged areas, tanks, lakes, jheels, etc., are inadequately utilised or are unutilised because owners are unable to undertake fisheries operations. Development of fisheries in these areas could increase the income of the farmers and reduce health hazards caused by mosquitoes, etc. Ownership disputes often result in inefficient use of fisheries resources. The NCA had recommended enactment of Fisheries Acts to regulate fisheries and related activities. The recent West Bengal Inland Fisheries Act, 1984 makes important provisions for proper utilisation of inland water areas for pisciculture and can usefully be studied for replication by other States in the region, wherever necessary.

(Paragraph 14.7.5)

258. Since loans for undertaking fish culture are given on long-term basis, the lease rights of water areas owned by Government/Gram Panchayats should be granted on a long-term basis to facilitate bank lending.

(Paragraph 14.7.9)

259. Urgent attention needs to be given to renovation of derelict and semi-derelict water areas which can be profitably used for practising pisciculture. Since the cost of improvement is high and cannot be left to private initiative, more plan resources will have to be set apart from this purpose.

(Paragraph 14.7.12)

260. Another important aspect which needs attention is the development of infrastructure facilities for marketing either in the Government or co-operative sector, so that small fishermen are assured of remunerative prices for fish catches.

(Paragraph 14.7.13)

261. The research findings and ongoing research programmes in the areas of animal husbandry and fisheries relevant for the region may be carefully studied by the research institutes for any further adaptive research which may be necessary before these could be transferred to the field.

(Paragraph 14.7.16)

262. Programme for achieving higher productivity and output calls for a marked increase in the volume of both production and investment credit, with a large share going to weaker sections and the backward areas.

(Paragraph 15.1.1)

263. There is a need for such credit policies and programmes as would enable small and marginal farmers to make step by step progress towards scientific and intensive use of their limited land resources by a greater input of both labour and capital. Most of the constraints they face cannot be overcome unless their capital resources are augmented, step by step, on a case by case basis.

(Paragraph 15.1.2)

264. A reorganisation of the rural credit structure and an improvement in the overdue climate may require policy decisions at all-India level by Government of India, Reserve Bank of India and NABARD. These would include:

- (i) review of interest rate structure, with an in-built mechanism for rewarding prompt repayers and punishing wilful defaulters;
- (ii) provision of reasonable credit to borrowers with good repayment record and adequate repayment capacity for meeting unavoidable social obligations (within certain limits) so that they do not have to borrow from money lenders;
- (iii) inducements to save and relief to be provided by way of grace periods and postponement/rephasing of loan repayment in case of genuine difficulty;

- (iv) improving the financial and managerial capabilities of co-operatives;
- (v) introducing an effective but simple supervised credit system;
- (vi) determination of short term and medium term credit entitlement for each borrower and ensuring adequate working capital within it;
- (vii) a review of the policy in regard to subsidies; and
- (viii) linking of credit with insurance.

(Paragraph,15.1.4)

265. The policy of helping weaker sections initiated since late 1960s will have to continue. At the same time, there is a need for adopting credit strategies suitable for handicapped regions, such as Eastern India, with particular emphasis on supervision and follow-up of the various credit programmes.

(Paragraph 15.1.6)

266. In addition to cost of inputs and labour, irrigation costs and service charges for hiring machinery and equipment from leasing agencies, etc., cultivators incur consumption expenditure between sowing and harvesting season and have also to meet the cost of bullock maintenance. Adequate provision for such consumption expenditure of the family will have to be included in the short-term production loan requirements of bulk of the farmers, who cultivate with their own labour.

(Paragraph 15.2.1)

267. Loans should be given as at present partly in kind or in vouchers for supplies and services and partly in cash. In some States, the cash component is large. The cash component should be confined to cost of labour put in by the farmer and for some consumption expenditure in the growing season.

(Paragraph 15.2.3)

268. There is a case for introduction of a voucher system (as in Indonesia) so that borrowers can obtain the needed inputs against vouchers from a list of selected dealers.

(Paragraph 15.2.4)

269. The due date for repayment should be fixed, say, two months after the expected harvest or one month after the marketing of the crop. A notice should be served a fortnight before the due date. The due date should never be fixed at a time when the loanee is likely to have inadequate income, i.e. before the likely marketing month or long after marketing.

(Paragraph 15.2.5)

270. In case of default penal interest rates should be 2 per cent per annum above the regular rates for the first four months of default and raised sharply to 4 per cent per annum for small and marginal farmers and 5 per cent per annum for others if overdue for more than four months.

(Paragraph 15.2.6)

271. In case of wilful default, additional penal measures should be imposed including attachment of property (but not of production requisites). Suitable adjustments should be made in the dates for penal action in the case of mixed farming, animal husbandry, etc. Before the signing of the loan documents, the details of penalties for default should be made clear to the loanee both orally and in writing.

(Paragraph 15.2.7)

272. In case of genuine difficulty arising from unforeseen calamities such as crop failures, sickness or death in the family, sickness or death of bullocks, etc., a grace period for repayments should be granted or short-term loan converted into medium-term loans.

(Paragraph 15.2.8)

273. In cases of natural calamities, there is at present a provision for conversion of short-term loans into medium-term loans, provided the designated authorities in the States issue certificates to that effect. But the issue of certificates is not promptly done. NABARD may pursue with the State authorities that certificates are issued promptly after a careful assessment.

(Paragraph 15.2.9)

274. If a borrower is faced by natural calamities for the third year in succession, there is a provision for writing-off of the first conversion loan in the case of small and marginal farmers, subject to a ceiling of Rs.300.00. Since a small or marginal farmer cannot meet the debt burden of crop failure for three years in succession, there

is a need to write off the first conversion loan in full. To facilitate such write-offs by the co-operatives, Relief and Guarantee Funds should be set up by the State Governments with adequate help from the Centre.

(Paragraph 15.2.10)

275. NABARD has suggested to the State Co-operative Departments that default of individual members of co-operative credit societies up to 10 per cent of their eligibility for short-term loans should be ignored and fresh finance made available on the understanding that they would clear both the dues out of sale proceeds of the next crop. This concession should be increased to 20 per cent during the first three years of the Seventh Plan to facilitate the special productivity programme for Eastern India.

(Paragraph 15.2.11)

276. The State Level Bankers' Consultative Committee should ensure that both commercial banks and co-operatives adopt scales of finance worked out by the Technical Committee and the District Level Consultative Committee should ensure that scale of finance appropriate to the district are adopted by the financing institutions.

(Paragraph 15.2.12)

277. The introduction of cash credit system with credit limits on an yearly basis as in the case of industry and trade should be considered for agriculture also. This would help farmers plan their production programmes for the entire year in advance and will promote multiple cropping.

(Paragraph 15.2.13)

278. There is a need for every farmer to know his credit entitlement. PACS may, therefore, prepare statements of credit entitlements (for both short-term and medium-term loans) of each member of the society.

(Paragraph 15.2.14)

279. Medium and long-term loans are required by farmers for such purposes as construction of dugwells, tubewells and water conveyance system, for land levelling, raising plantations and horticulture crops, for pumpsets and other farm machinery, repair of houses and meeting social obligations, etc. They may be made available to farmers individually or in groups after a careful assessment on the basis of appropriate norms and the general reputation of the beneficiaries as prudent and efficient farmers.

(Paragraph 15.3.1)

280. The investment cost should be properly assessed and adequate loans to cover the same should be provided. Both over and underfinancing are harmful. The former leads to misutilisation and the latter results in incomplete investments or drives the farmer to seeking supplementary finance from moneylenders.

(Paragraph 15.3.2)

281. While sanctioning term loans for tubewells, dugwells, pumpsets and other minor irrigation structures, there should be no stipulation on the minimum size of holding. The scope for sharing or selling water should be taken into account in working out economics of the scheme.

(Paragraph 15.3.3)

282. As in the case of short-term credit, a penalty should be imposed on defaults of term loans. The penalty should be 2 per cent per annum for the first default and 4 per cent for small and marginal farmers and 5 per cent for medium and large farmers for the second and subsequent defaults. In case of wilful defaults, as in the case of short-term loans, penal measures should be imposed including attachment of property, but not of production requisites. The State Governments should facilitate the recovery of such dues, by taking appropriate administrative measures.

(Paragraphs 15.3.6 and 15.3.7)

283. In case of genuine hardship, the repayments due may be postponed or rescheduled and penal measures withdrawn.

(Paragraph 15.3.8)

284. Even in borderline cases where it is difficult to determine "genuine hardship" ^{if} ~~of~~ ^{these} loanees have been regular in payment of interest, _L may be given adequate extension of time for repayment of principal and penalty may be waived. Those, whose total payment of interest and principal in the past exceeds the total interest due up to date should not be regarded as defaulters.

(Paragraph 15.3.9)

285. Loanees should be made fully aware of their obligations and due dates of repayment. Hence, loan pass-books should be issued, wherein all loan transactions of beneficiaries from credit institutions are to be entered. This system should be introduced with effect from July 1985.

(Paragraph 15.4.1)

286. All loanees may be issued "Loan Cards" for each loan. Due dates of repayment/interest should be entered in bold letters in local languages in distinguishing colours which will enable the loanee to know his loan obligations and due dates at one glance.

(Paragraph 15.4.2)

287. It is necessary to ensure that loans are utilised for the purpose disbursed. The responsibility for supervision and follow-up of proper utilisation of loans should be placed on PAC Secretary/Field Officers/Supervisors, who should report cases of misutilisation promptly to CCB.

(Paragraph 15.4.6)

288. The Society Secretary/Bank Manager should meet their clients at least once in a quarter. It will be helpful if each Society/Bank organizes a meeting of farmers once in six months or one year at Panchayat level to facilitate the dissemination of information on the loaning facilities available to farmers and their repayment obligations.

(Paragraph 15.4.7)

289. In the case of loanees, with a record of no default for three consecutive years, two special concessions may be given: (a) income of their family members may be taken into account in fixing their loan entitlement and (b) special loans may be given for meeting unavoidable family obligations e.g., wedding, medical and funeral expenses, subject to a prescribed proportion of their income or loan entitlement.

(Paragraph 15.4.8)

290. Banking habit may be promoted among farmers by
- (a) providing that the minimum deposit during the post harvest season for more than 2 months in their accounts with PACs or CCBs/ Banks/RRBs would automatically entitle them for a cash credit/overdraft facility of an equivalent amount in the first year, 50 per cent more in the second year and 100 per cent more in the third year onwards, provided there is no default meanwhile.
 - (b) allowing PACs, CCBs and RRBs to give
 - (i) higher interest rate of say 2 per cent over the standard savings bank rate on the minimum balances kept in deposit in their accounts for a period of at least 3 months, and
 - (ii) a higher interest rate of, say, 2 per cent on fixed deposits over and above those applicable in the case of bank deposits of comparable maturities.

(Paragraph 15.5.1)

291. Steps should be taken to ensure that there is no net outflow of funds from rural areas through the banking system. In fact it should be the other way about considering the capital requirements of the vast number of resource-poor farmers.

(Paragraph 15.5.3)

292. We would urge the adoption of a rational interest rate policy instead of making ad-hoc adjustments. One possible method is to link the interest rates for agricultural purpose with the Bank rate at the lower end and at roughly 2 or 3 per cent lower than the market rate at the upper end.

(Paragraph 15.6.2)

293. For helping needy farmers, greater use should be made of concessions regarding grace and repayment periods than in interest rate. Unduly low interest rate tends to be counter-productive in several ways. It leads to uneconomic use of capital, encourages corrupt practices in lending agencies, adversely affects deposit mobilisation and discourages flow of capital from non-agricultural to agricultural sectors.

(Paragraph 15.6.3)

294. The cooperatives may be allowed to charge a somewhat higher rate of interest on loans advanced by them if found necessary in view of the higher interest they will offer on deposits. However, the differences in the interest rates should not be too wide to wean away farmers from cooperatives to commercial banks.

(Paragraph 15.6.4)

295. For encouraging farmers to go in for Group Loans, an interest concession roughly of say 1/10 of Bank rate over that normally admissible both for short-term credit and term loans (but not below bank rate) and/or concessions regarding grace and repayment periods may be given, in addition.

(Paragraph 15.6.5)

296. State Cooperative Departments should notify all defaulters to ^{pay} ~~have~~ their dues within a stipulated period and provided they pay 30 per cent of the principal or 70 per cent of the interest due by the next harvest season, they may be allowed more time for full payment of dues as such part payments would be an indication of their earnestness to repay loans within the given time. If no repayments are made even

partly within the stipulated time, stern coercive action including penal measures, if necessary should be taken by CCBs/PLDBs in consultation with the Registrar of Cooperative Societies.

(Paragraph 15.8.1(ii))

297. In case of nonwilful default, as an one shot affair, overdues may be transferred to a 'Blocked Account' repayable in 5 to 7 annual instalments. The State Governments should give a guarantee that any shortfall in the collection of such instalments would be made good by it to the credit institutions. A matching grant for the purpose may be made available by Government of India to the State Governments.

(Paragraph 15.8.1(iii))

298. The present overdues ceiling of CCBs in Eastern India should be increased from 60 per cent to 70 per cent of demand for the first three years of the Seventh Plan to facilitate the introduction of the special programme for stepping up agricultural productivity in this region. Alternatively, the overdues ceiling of CCBs may be calculated with reference to the overdues of wilful defaulters only. For this purpose, all loanees who have paid a certain fraction (say 50 per cent) of their total dues may be classified as non-wilful defaulters and all others as wilful defaulters. Similar action will have to be taken in the case of PLDBs so that overdues are reduced suitably. The provision of the State Government contribution to share capital of the PLDBs to reduce notionally overdues should be applied.

(Paragraph 15.8.1(iv) and (v))

299. The Chief Ministers may make periodically policy statements deprecating wilful default and declaring that no further waiver of dues would be permitted and stringent penal measures would be firmly imposed on defaulters in future.

(Paragraph 15.9.2(i))

300. During the recovery season, a special drive should be launched jointly by CCBs and PACs in the case of short-term loans and by PLDBs and LDB in the case of long-term loans, with full support from the Registrar of Cooperative Societies and the District Collector.

(Paragraph 15.8.2(iv))

301. The Subcommittee of District Consultative Committee should send every quarter a report on the progress made in recoveries and steps needed to improve them to the State Level Committee of Secretaries proposed by us, with a copy to RBI and NABARD regional offices, for necessary follow-up action.

(Paragraph 15.8.3)

302. The State Level Standing Committee of Secretaries should arrange a workshop of all the District Collectors once in every 6 months to review the progress made in recoveries.

(Paragraph 15.8.4)

303. CCBs should make available loans to PACs for meeting credit requirements of non-defaulting members. CCBs eligible for refinance from NABARD may obtain the needed resources from NABARD and lend them to PACs.

(Paragraph 15.9.1)

304. CCBs, jointly with Apex Bank, may ascertain the constraints inhibiting the growth of loan business of PACs and assist them in overcoming them. For this purpose, CCBs may take up a phased programme of reorganization of such PACs. This programme should be completed by the end of the Seventh Plan.

(Paragraph 15.9.2)

305. Whenever PACs are financially and managerially weak, CCBs may take up direct financing of farmers until such time PACs become viable units.

(Paragraph 15.9.3)

306. Each CCB should set up a Special Fund to assist weak PACs by earmarking a part of the profits or by a charge on Profit & Loss Accounts of CCB.

(Paragraph 15.9.5)

307. Societies which have shown consistently bad performance for the last three years or more and where more than 80 per cent of members are defaulters may be wound up. Non-defaulting members may be encouraged to approach nearby rural banks or form an altogether new society of non-defaulters. Penal action should be taken by State Government against the wilful defaulters.

(Paragraph 15.9.7)

308. In advancing term loans, proper care needs to be taken to ensure that loanees get adequate working capital. For, otherwise the investment will be infructuous and not provide the expected benefit.

(Paragraph 15.9.9)

309. The State Cooperative Departments should identify selected PACs/ PLDBs and introduce the "one-window" experiment in substantially larger number of PACs as expeditiously as possible.

(Paragraph 15.9.10)

310. LAMPS should be reorganised with a smaller area of operations, wherever necessary. Steps should be taken to improve their credit and noncredit business and make them viable within a definite time-span, say 5 years. Until such time, they should be given managerial subsidy.

(Paragraph 15.9.11)

311. LAMPS may be supplied with motor vans (with four wheel drive for difficult terrain, where necessary), for providing better credit facilities and for transportation of goods to remote haats or villages.

(Paragraph 15.9.12)

312. A half-yearly seminar may be conducted at the State level in collaboration with the representatives of LAMPS, TDCCs, Voluntary organizations, State Departments of Tribal Development and Cooperation, etc., for the purpose of identifying problems faced by LAMPS and suggesting appropriate remedial measures.

(Paragraph 15.9.13)

313. A Special Cell may be set up in the office of the Registrar of Cooperative Societies to monitor the working of LAMPS.

(Paragraph 15.9.14)

314. Reports of seminars and monitoring by the Special Cell for LAMPS should be submitted to the State Level Committee of Secretaries for necessary follow-up action.

(Paragraph 15.9.15)

315. NABARD may undertake a fresh review of the working of LAMPS with a view to providing guidelines for reorganizing them as smaller units and improving their managerial competence.

(Paragraph 15.9.16)

316. There is a strong case for building up a cadre of co-operative Bank Supervisors for CCBs and PLDBs. The Registrar of Co-operative Societies, in consultation with SCBs and LDBs, may take the necessary lead in this matter.

(Paragraph 15.9.17)

317. PACs and CCBs should be assisted to acquire adequate facilities, office and image of an efficient small bank.

(Paragraph 15.9.19)

318. At each PLDs, there should be at least one technical officer, well acquainted with agriculture. The financial assistance available from NABARD's R & D Fund could be utilized for the purpose.

(Paragraph 15.9.20)

319. NABARD may ensure that banks conform to the discipline laid down by it. Such banks which do not conform to the discipline may be rendered ineligible for getting refinance from NABARD and subjected to other disciplinary action.

(Paragraph 15.9.21)

320. There should be a convention that no MP or MLA or Chairman or Secretary of a political party should accept the position of President of a PAC/PLDB. Further, no person should be allowed to hold the office of President for more than three terms either in the same Society or any other Cooperative Credit/Marketing Society during his life time.

(Paragraph 15.9.22)

321. Each RRB should open a supervised credit window to cater to the needs of marginal farmers and agricultural labourers on the lines of Grameen Banks in Bangladesh.

(Paragraph 15.10.3)

322. A time-bound programme of training of staff at all levels in PACs, CCBs, PLDBs, commercial banks, and RRBs should be taken up jointly by the Central Cooperative Training Committee, NABARD, State Governments, and concerned institutions.

(Paragraph 15.11.1)

323. Farm Clinic experiments of the Syndicate Bank may be emulated by other banks with appropriate modifications for spreading the banking habit and improving recovery climate in selected areas.

(Paragraph 15.12.2)

324. NABARD and RBI should bring out in booklet form the procedures to be followed by credit institutions at grass roots level in disbursement of short-medium and long-term loans, terms and conditions of such loans and reliefs/concessions granted, etc.

(Paragraph 15.13.1)

325. Subsidies should not be given as 'investment subsidy' as hitherto, but linked with performance. There is also a strong case for gradually moving away from the system of general and continuing subsidy, to a system of "tapering" subsidy for limited periods of initiation, tailor-made for specific target groups of intended beneficiaries.

(Paragraphs 15.14.1 and 15.14.2)

326. The State Governments in consultation with GIC should introduce an insurance scheme for investments in productive assets such as tubewells, pumpsets, machinery, etc. For bank financed and government programmes, such insurance should be made compulsory.

(Paragraph 15.15.1)

327. There is a need to introduce crop insurance to cover both borrowers and non-borrowers. The premium should be low enough to induce farmers to avail of insurance facility. To begin with, crop insurance may be introduced in selected areas as a pilot scheme and gradually extended to other areas. The GIC may take up with the State Governments a programme for introduction of a crop insurance scheme and provide the necessary technical and financial help for the purpose.

(Paragraph 15.15.4)

328. NABARD, as an apex Agricultural Development Bank, has a key role to play in facilitating a greater flow of credit, both short-term and long-term to agriculture in general and resource-poor farmers in particular in the eastern region.

(Paragraph 15.16.1)

329. If agricultural productivity of Eastern India, per ha and per capita has to reach the levels envisaged by us during the Seventh and Eighth Plan periods, a very substantial inflow of credit will be needed. The disbursement capacity of the credit institutions, absorptive as well as repayment capacity of the farmers and smooth flow of funds both ways have to be specially strengthened. NABARD may consider setting up a special Division for Eastern India under a very senior officer to coordinate and follow up all the special effort that will be needed for the region.

(Paragraph 15.16.2)

Investment and Credit Requirements

330. The public outlay on agriculture and related sectors and credit flow from the banking system would be substantially higher in the Seventh and Eighth Plan periods to support our strategy for accelerated agricultural development in Eastern India.

(Paragraph 16.1.1)

331. Public outlay on agriculture and allied services during the Seventh Plan is assumed by us to be roughly double the anticipated expenditure during the Sixth Plan. An increase of a similar order is envisaged for the Eighth Plan, as shown below.

Public outlays on Agriculture and
Allied Services

(Crores)

State/Region	Sixth Plan (Anticipated)	Seventh Plan (Estimated)	Eighth Plan (Estimated)
West Bengal	373	780	1600
Orissa	285	580	1150
Bihar	433	930	1850
East U.P.	330	700	1400
Eastern India	1421	2990	6000

(Paragraph 16.2.1)

332. Our estimate of additional area to be irrigated from minor irrigation mainly through groundwater exploitation during the two plan periods is about 80 lakh ha.

Additional Potential under Minor
Irrigation

(Lakh ha)

State/Region	During Seventh Plan	During Eighth Plan	Total
West Bengal	7.2	11.8	19.0
Orissa	4.1	8.2	12.3
Bihar	10.9	17.4	28.3
East U.P.	15.7	7.0	22.7
Eastern India	<u>37.9</u>	<u>44.4</u>	<u>82.3</u>

(Paragraph 16.2.4)

333. For achieving the above targets, substantial investments in sinking of tubewells, construction of dugwells and installation of pumpsets will be necessary. Our two estimates of investments on minor irrigation structures are given below.

Minor Irrigation Structures

(Lakh Units)

Type of Structure	Estimate I		Estimate II	
	Seventh Plan	Eighth Plan	Seventh Plan	Eighth Plan
Shallow tubewell bores	8.7	10.0	5.6	8.4
Shallow tubewells and pumpsets	0.9	1.2	0.8	0.8
Medium/deep tubewells/ riverlifts	0.2	0.2	0.1	0.2
Dugwells	1.6	3.9	1.2	3.7
Pumpsets	10.4	15.3	7.4	12.6

(Paragraph 16.2.5)

334. The investments on shallow tubewell bores and dugwells will be mainly financed under a 100 per cent Centrally Sponsored Scheme. Provision has also to be made for extension of electric lines in the case of electric pumpsets, which will also be met by the Central Government. The cost of energisation of pumpsets which will be met out of a centrally sponsored scheme, for the region as a whole will be Rs.235 crores during Seventh Plan and Rs.300 crores during Eighth Plan. The total outlay on 100 per cent Centrally Sponsored Schemes (for tubewell bores and pumpsets and energisation of pumpsets) for the region will be Rs.575 crores during Seventh Plan and Rs.780 crores during Eighth Plan.

(Paragraphs 16.2.6 and 16.2.7)

335. On the basis of projections made, the additional area that would be brought under major, medium and minor irrigation by the end of the Eighth Plan period would range between 95 and 115 lakh ha. By the end of the Eighth Plan, nearly 70-⁷⁵~~70~~ per cent of the irrigation potential would be utilised.

(Paragraph 16.2.9)

336. Drainage problems are particularly acute in command areas of irrigation projects in Eastern India as well as in deltaic areas of Orissa and West Bengal. Drainage needs to be given top priority in our strategy. An allocation of Rs.600 crores during the Seventh Plan and Rs.700 crores during the Eighth Plan may be earmarked in the Central Sector for drainage works to be taken up in terms of a comprehensive Master Plan for Eastern India, in areas affected by waterlogging and drainage congestion.

(Paragraph 16.2.10)

337. The total investment outlay on major, medium and minor irrigation, drainage, CAD and flood control during Seventh and Eighth Plan periods will be roughly, Rs.5020 crores and Rs.7430 crores respectively. In case of shortage of resources, drainage, minor irrigation and CAD should be given higher priority.

(Paragraphs 16.2.11 and 16.2.12)

338. The cost of electrification of electric pumpsets needed to be utilised on the bores sunk and dugwells constructed under centrally sponsored scheme will be met by the Central Government. For the balance of electric pumpsets, a large part of the cost will be met by way of bank finance.

(Paragraph 16.3.1)

339. For setting up of rural industry centres in secondary markets and no industry areas provision has been made for investment cost and recurring cost for maintenance etc., our estimate of the cost during Seventh Plan and Eighth Plan is Rs.300 crores and Rs.460 crores respectively. It will, however, be desirable to provide substantially larger amounts for this purpose, if possible.

(Paragraph 16.4.1)

340. Our estimate of short-term credit will be Rs.3160 crores and Rs.3530 crores for the terminal years of the Seventh and Eighth Plans respectively. Our estimate of medium-term and long-term loans will be Rs.1635 crores and Rs.2000 crores during Seventh Plan and Eighth Plan respectively.

(Paragraphs 16.5.3 and 16.6.1)

341. The investment and credit requirements envisaged in this report are substantially higher than the Sixth Plan provision. It will not be possible to accommodate them within the normal State Plan ceilings of the next two Plans, without very adversely affecting other priority sectors. The State Plans should seek to cover the same proportion as in the Sixth Plan. The balance should be provided partly through centrally sponsored or central projects as may be convenient and partly through special grants and loans over and above the standard formula for central assistance for State Plans.

(Paragraph 16.7.2)

342. The total outlay envisaged by us is not really so large as cannot be accommodated in the Plan by postponing, if necessary, some less urgent or long gestation projects.

(Paragraph 17.1.16)

343. Recommendations of some earlier Commissions and Committees which have important significance for Eastern India as listed at Appendices 7 to 13 of Part I of our Report need to be implemented effectively and expeditiously.

(Paragraph 1.9.2)

STATE REPORTS
RECOMMENDATIONS FOR AGRO-CLIMATIC ZONES

The policy measures for accelerating agricultural development in West Bengal, Orissa, Bihar and East Uttar Pradesh, are, by and large, common and are given in the General Report on Eastern India in Part I. Action programmes needed to overcome the constraints at the Zonal level are, therefore, indicated below :

II WEST BENGAL

1. Hill Zone
(Darjeeling District)

In this zone, suitable plant coverage, e.g. fruit trees or fodder crops, should be taken up for controlling soil erosion. To improve income of hill people, attention needs to be given for rejuvenating orange orchards as also for development of soyabean and mushroom cultivation. Cultivation of wheat should be extended to more areas during rabi season. Feasibility of extending maize cultivation during summer season and introduction of pulses in the farming system should be explored. Suitable programmes for exploiting perennial streams known as 'Jhora' for irrigation purposes should be taken up.

(Paragraph 5.11(i))

2. Terai Zone
(Jalpaiguri and Cooch Bihar Districts)

In this zone, a thorough survey of micro-nutrients and lime deficiency should be conducted as an essential prerequisite for cultivation of HYV cereals, pulses, etc. Organic manures should be developed and popularised. Balanced fertilisation programme including use of

lime and micro-nutrients should be taken up. In sand laden areas, soil conservation and forestry development need to be taken up. Private shallow tubewells and dugwells with pumpsets should be taken up in this zone. Agro based industries utilising jute sticks, bamboo and other raw materials for manufacture of cardboards, news print etc., also need to be encouraged.

(Paragraph 5.11(ii))

3. Alluvial Zone (I)
(West Dinajpur, Malda, Murshidabad
and Nadea Districts)

In this zone, there is considerable scope for multiple cropping through optimum utilisation of ground and surface water. Priority has to be given for construction of deep tubewells. Also installation of private tubewells needs to be encouraged. Dugwells with pumpsets should also be encouraged. As this zone has great potential for growing wheat, its cultivation should be stepped up by providing adequate irrigation facilities. A thorough survey of surface and ground water resources should be undertaken for exploring possibility of conjunctive use of water from various sources. Flood control measures need to be stepped up on the lines recommended by the National Committee on Development of Backward Areas. To reduce water logging, there is need for simultaneous development of drainage facilities and underground water resources. For speedy adoption of HYV under paddy, seed banks may be created for buffer stocking of such seeds. In this zone, there is scope for extending potato cultivation in higher soils. Production of coconut and other fruits should also be taken up.

(Paragraph 5.11(iii))

4. Alluvial Zone (II)
(Birbhum, Burdwan, Hoogly and Howrah Districts)

In this zone, there is scope for taking up a number of new medium irrigation schemes and installation of shallow tubewells and dugwells. Land put to cultivation of paddy during summer season should be gradually shifted to wheat and other crops such as pulses requiring less water, as compared to paddy. In Hoogly, potato cultivation needs to be extended further with adequate supporting facilities for transport, marketing, storage, etc. Measures should be taken for development of drainage. Small and marginal farmers should be helped to grow high value crops like fruits, vegetables, etc. in order to enable them to raise their income. Rice straw and rice bran should be used for manufacture of straw board and rice bran oil.

(Paragraph 5.11(iv))

5. Red and Laterite Soils Zone
(Purulia and Bankura Districts)

For improving soil fertility, soil conservation and soil amelioration, water harvesting techniques, application of organic manures and balanced fertilization need to be undertaken. Other measures such as afforestation, contour planting of trees and agro-forestry also have to be taken up. To overcome the problem of erratic rainfall medium and minor irrigation schemes have to be undertaken. Cultivation of dry crops such as maize, small millets, groundnut etc. which need less water has to be encouraged. In small and marginal farms cultivation of high value crops may be encouraged. The adaptability of new crops such as guava, pomegranate, custard apple and cashewnut needs to be tested in this zone. In the uplands, rice may be replaced by short duration and high yielding varieties of maize, sorghum, soyabean, etc.

(Paragraph 5.11(v))

6. Alluvial-cum-Coastal Saline Zone
(Midnapore and 24-Parganas Districts)

In southern parts of this zone, it is necessary to undertake soil amelioration measures by removing salinity and alkalinity of the soils, wherever necessary. Application of gypsum before rains, and green manuring with sesbania crop can improve rice yields to a considerable extent. In order to prevent the ingress of saline water, flood control measures along with embankments should be taken up. For protection of embankments, a programme of social forestry including strip planting of roadsides, canal banks and embankments with fast growing species of casurina, babla etc. should be encouraged. Measures for drainage have to be initiated to reduce the impact of waterlogging. Suitable implements for tilling soils while they are wet, as also a ridger for sowing crops in furrows to evade the effect of salinity are to be developed. Sinking of deep tubewells and diesel pumpsets and tapping perennial rivers and rivulets by installation of lift irrigation devices require immediate attention. In saline areas, short duration and salinity tolerant varieties of crops should be developed. Keeping in view the scarcity of water, cultivation of cash crops, such as coconut, requiring less water should be taken up. For developing Sunderbans area, a special programme of development may be launched on the lines of Rangabellia project. In saline and alkaline lands cultivation of sugarbeet, watermelon, etc. may be encouraged. The existing mono-cropping pattern (rice) should be replaced by multiple cropping with introduction of short duration varieties of paddy, followed by a second crop like barley, chillies, sunflower, etc.

III. ORISSA

1. Northern Plateau
Mayurbhanj (~~Mayurbhanj~~, Keonjhar and
Sundergarh Districts)

- (i) Micro-watershed development and agro-forestry need to be given special priority in this zone.
- (ii) While it is necessary to develop in rainfed areas water harvesting technology for utilisation of excess run-off water, it is also necessary to develop and popularise soil and water management practices.
- (iii) The adaptive research stations in this zone should concentrate on development of improved rainfed agriculture and package of practices to improve productivity.

(Paragraphs 12.3.15 and 12.11(i))

2. Central Table Land
(Bolangir, Sambalpur and
Dhenkanal Districts)

- (i) In drought-prone areas, the State Government should implement the recommendations of the National Committee on Development of Backward Areas on Drought-prone areas.
- (ii) In the irrigated areas of Hirakud Project, it may be ensured that potential created is utilised to the optimum extent and tail-end fields are not starved of irrigation.

- (iii) In order to minimise the effects of erratic rainfall and long dry spells during the rainy season, the adaptive research stations in this zone should develop suitable millet varieties and early maturing rice varieties tolerant to moisture stress.

(Paragraphs 12.3.16 and 12.11(ii))

3. Eastern Ghat
(Koraput, Kalahandi and
Phulbani Districts)

- (i) It is necessary to undertake an integrated programme of water harvesting, water management, lift irrigation and contour bunding.
- (ii) Micro-watershed development and agro-forestry have to be accorded special priority in this zone.
- (iii) The adaptive research stations should develop suitable rice varieties for different levels/situations and also a package of practices for jhola rice cultivated in tribal areas. Research is also needed for identification of wheat varieties suitable for pre-winter and winter season. Further, research is required for evolving ragi varieties of different maturity groups to fit in multiple cropping patterns and identification of high yielding varieties of other millets.
- (iv) The adaptive research stations should also develop a package of manurial, cultural and herbicidal practices so that cultivation of vegetable crops undertaken in this zone is remunerative to farmers.

(Paragraphs 12.3.17 and 12.11(iii))

4. Coastal Plain
(Balasore, Cuttack, Puri and
Ganjam Districts)

- (i) Measures should be taken for maximum utilisation of irrigation in this zone. Farmers should be educated about the benefits of on-farm development like construction of field channels, drainage, etc., as well as economy in the use of irrigation water.
- (ii) As waterlogging is a serious problem in some parts of this zone, it is necessary to formulate a Master Plan for improving drainage facilities.
- (iii) The zone is rich in groundwater resources which need to be developed. Conjunctive use of rainfall, surface and groundwater resources would be helpful in increasing agricultural productivity.
- (iv) The adaptive research stations in this zone should devise suitable amelioration measures and culturable practices for saline soils salt tolerant crops varieties need to be evolved to fit in the cropping pattern adopted for the saline lands.
- (v) For flood-prone and waterlogged areas, suitable flood-resistant varieties should be evolved.
- (vi) Suitable HYV of rice need to be evolved to be grown in deep water conditions during Kharif to improve productivity in low lands which are affected from waterlogging and floods every year.

(Paragraphs 12.3.18 and 12.11(iv))

IV. BIHAR

1. North West Alluvial Plains Zone
(West Champaran, East Champaran, Gopalganj, Siwan, Saran, Sitamarhi, Muzaffarpur, Vaishali, Madhubani, Darbhanga and Samastipur Districts)
 - (i) Nearly one-third of the total cultivated areas in the districts of Darbhanga, Sitamarhi, Samastipur, Muzaffarpur and East Champaran remain flooded during Kharif season. In such areas, flood control and drainage measures should be undertaken.
 - (ii) For increasing the irrigation intensity of cropping in irrigated areas, utilisation of available potential in canal irrigation should be improved through better water management. Groundwater potential also should be fully exploited through tubewell irrigation.
 - (iii) In Darbhanga, Sitamarhi, Samastipur, Muzaffarpur and East Champaran districts, rising water table in flood-prone areas has gradually partial shift of maize (Kharif) to rabi season. Suitable maize varieties and appropriate management technologies for cultivation of this crop during rabi have to be developed. It is also necessary to adopt new rice varieties (developed by Central Rice Research Institute, Cuttack and other research Stations) which are tolerant to flood and waterlogging. Similarly, rice varieties suited to lowlands need to be evolved and adopted.

- (iv) Drought-resistant varieties of wheat, flood-resistant varieties of sugarcane, rapeseed and mustard which can resist aphid attack have also to be developed.
- (v) In calcareous soils, use of bio-fertilizers like blue green algae and azolla should be popularised to supplement nitrogenous fertilizers.

(Paragraphs 19.3.14(i)
and 19.11.1)

2. East Alluvial Plains Zone

(Purnea, Katihar, Saharsa, Begusarai,
Monghyr and Bhagalpur Districts)

- (i) Development of irrigation and drainage facilities is necessary in Saharsa and Kosi areas which face problem of floods, particularly in "diara" lands. Groundwater resources should be exploited fully.
- (ii) In the flood affected areas of this zone, after flood water has receded, intensive rabi cropping with irrigation and raising improved varieties of wheat, mustard, pulses, etc. should be undertaken. After rabi, irrigated summer cropping should be taken up with short duration summer varieties of maize, moong, rice, etc. so as to be harvested before the onset of monsoon. For kharif cropping, flood tolerant varieties of paddy such as Madhukar, Chokia-59 etc., may be adopted.
- (iii) Heavy leaching of soils causing soil acidity has to be checked. In areas effected with high soil acidity, the land should be puddled and then seeded or transplanted.

(iv) Cultivation of jute suffers from low yields. Research is necessary to identify the reasons for low yield so that suitable remedial action can be taken.

(v) In the case of fruit crops grown in the zone, such as pineapple, banana, coconut, etc., suitable agronomic practices should be developed to increase productivity.

(Paragraphs 19.3.14(ii)
and 19.11.2)

3. South West Alluvial Plains Zone
(Gaya, Aurangabad, Rohtas, Bhojpur,
Patna, Nalandah and Nawadah Districts)

(i) In the 'diara' lands in Patna and Bhojpur districts, early maturity varieties of maize may be adopted, which can be harvested before invasion of flood water.

(ii) In 'tal' lands of Patna and Nawadah districts, which remain inundated during kharif season, high yielding varieties of pulses should be tried.

(iii) In drought-prone areas of Aurangabad and Rohtas districts, cultivation of crops like pulses, maize, small millets and groundnut, etc., should be encouraged.

(iv) Cheap farm implements suitable for use in heavy textured soils should be provided.

- (v) Agricultural Universities and research stations should develop for irrigated areas, a suitable multiple cropping system, with emphasis on pulses and wheat in rabi season.

(Paragraphs 19.3.4¹⁴(iii)
and 19.11.3)

4. Plateau Zone
(Hazaribagh, Giridih, Santhal Parganas,
Dhanbad, Palamau, Ranchi and Singhbhum
Districts)

- (i) It is necessary to augment irrigation facilities and to adopt suitable water management techniques. Irrigation facilities in this area can be augmented by tapping the riverbeds through lift irrigation schemes and by constructing wells on the beds of the river. Further, special irrigation structures such as Kolhapur weirs, need to be constructed for making full use of water in streams, nullahs, springs and rivulets wherever suitable, tubewell and dugwell construction needs to be vigorously pursued. Water management should be supported by adequate supply of electricity and diesel.
- (ii) To overcome soil erosion, which is the major constraint to agricultural productivity in this zone, economic soil and water conservation techniques especially on watershed basis, should be developed. Introduction of suitable fodder crop or fruit crop, afforestation and agroforestry may help in soil conservation.

- (iii) Soil acidity is another major constraint to agricultural productivity in this zone. Cropping systems suited to such soils should be identified.
- (iv) To increase availability of phosphate and other elements, research stations should evolve suitable management practices.
- (v) In low lands, varieties of rabi crops which can fit in with double cropping system under late sowing and rainfed conditions need to be developed. For uplands, suitable varieties of rice, ragi, groundnut, etc., which can withstand prolonged drought need to be evolved. In tribal areas, crops depending upon their eating habits as also orchard cultivation should be developed.
- (vi) Research, training and extension work in the field of tassar silk and lac should be developed as tribals are engaged in these occupations.

(Paragraphs 19.3.14(iv)
and 19.11.4)

V. EAST U.P.

1. North Eastern Plains Zone
(Bahraich, Gonda, Basti, Gorakhpur
and Deoria Districts)
 - (i) The main thrust in this zone should be on effective flood control measures and adoption of suitable crop patterns and flood-resistant varieties of crops.
 - (ii) Groundwater needs to be exploited more intensively in this zone.

(Paragraph 26.4.1)

2. Eastern Plains Zone

(Faizabad, Sultanpur, Pratapgarh, Jaunpur, Azamgarh, Ballia, Ghazipur, Varanasi and Allahabad Districts)

- (i) It is necessary to evolve suitable techniques for reclamation of usar (saline) soils, which are found in large parts of Sultanpur, Pratapgarh, Ballia and Azamgarh districts. Application of gypsum and pyrates should be resorted to crop varieties suitable in such soils should be adopted.
- (ii) A large part of this zone is covered by 'diara' lands on the banks of Ganga, Ghagra and Gomti rivers. These lands require special soil and water management techniques and selection of suitable crops. The cropping pattern for 'diara' lands would include intensive rabi cropping after the recession of water with irrigation and raising improved varieties of wheat, potato, peas and mustard and other crops. After rabi, short-duration varieties of summer maize, mung, etc., should be taken up which could be harvested before rains. During kharif season, flood tolerant varieties of rice may be adopted.
- (iii) It is necessary to strengthen the pest surveillance and forecasting units for providing timely warning about the spread of insects, pests and diseases. Pesticides should be made available in adequate quantities.

(Paragraphs 26.4.2, 26.4.3 and 26.4.4)

3. Vindhyan Zone
(Mirzapur District)

- (i) Irrigation facilities in Mirzapur district should be augmented by the construction of check dams, etc., on watershed basis.
- (ii) The black soils become sticky on wetting and develop wide cracks during summer. Research efforts should be directed towards development of short-duration varieties of paddy which can mature before water stress sets in. The dwarf and high yielding varieties of wheat which can be raised with irrigation or with moisture should be developed. It is also necessary to popularise dry-farming technology in respect of wheat, gram, linseed, lentil, etc., which can be grown under rainfed conditions.
- (iii) It is necessary to develop short-duration and high yielding varieties of small millets in red soils which have poor water retention capacity.
- (iv) It is necessary to develop soil management practices in black and red soils, with particular reference to land preparation and placement of fertilizers.

(Paragraphs 26.4.5, 26.4.6,
26.4.7 and 26.4.8)