

CHAPTER 7

AGRICULTURE PRODUCTION

7.1 Agriculture plays a vital role in the economic development of the State and continues to be the backbone of our economy. In the coming years, agriculture will face many challenges due to the rising population. This will directly increase the demand for food and non-agricultural sectors, like industry and urbanisation will put greater demand on land and water resources available for agriculture. The scope of increase in arable land and exploitation of additional water resources for irrigation will also decline in future. Hence, there is a greater need for conservation and efficient utilisation of natural resources. Agriculture needs intensification of production and improved efficiency in use of resources.

7.2 Rajasthan is the second largest State in the Indian Union with a geographical area of 3.42 lakh sq. kms. Agriculture contributes about 50 per cent of State domestic product. The average size of land holdings in the State is 3.96 ha. as compared to 1.57 ha., at the all India level.

7.3 Rajasthan being a predominantly agrarian State, 77 per cent of the population is living in rural areas and about 70 per cent depends on agriculture as source of livelihood. The geographical features of Rajasthan is dominated by the Aravalli range which divide the State into two distinct zones. The region to the west and north-west, comprising of eleven districts and nearly 61 per cent of the total area of the State, is known as the great Indian Thar Desert. The soil type in this region is sandy which is poor in nitrogen and has low water holding capacity. The south-east and eastern part of the Aravalli Hills is productive for agriculture purposes having clay loam soil type. The rainfall fluctuates from 200-550 mm in the western and semi arid parts to 550 -1000 mm per annum in south eastern and eastern part of the Aravalli Ranges.

7.4 The salient features of Agriculture in Rajasthan are as under:

- Agriculture in Rajasthan is primarily rainfed.
- The period of monsoon is short, around three months. Its onset is late and withdrawal early, in comparison to other States.
- 90 per cent of the rainfall is received during monsoon season. In addition to spatial variation in rainfall there is great variation in the yearly pattern.
- 65 per cent of the total cultivation is under kharif season and is mostly dependent on rainfall, which is aberrant and uncertain.
- 60 per cent of the irrigated area is under wells and tube wells. The under ground water table, is falling by one meter every year.

Constraints

Natural Constraints

- Rainfall is highly inadequate and aberrant in nature.
- 61 per cent area lies in arid and semi-arid tracts, where soils are having poor fertility, low water holding capacity, high infiltration rate and shallow in depth in some areas.
- One million hectare area is under problematic soils (saline and alkaline).
- Due to scarcity of rainfall there is limited availability of ground water.

- The crops suffer due to high temperatures and wind velocity.

Social Constraints

- Higher growth rate of population, as compared to the National average.
- Increased fragmentation of land holdings from 51.07 lakh in 1990-91 as compared to 44.87 lakh in 1980-81.
- Low level of female literacy (44%).
- Low social status of women.
- Lower attention to women folk despite their predominance in agriculture work.
- A high percentage of population belongs to SC, ST category (30%), most of whom live below poverty line and are unable to absorb the new technology and risk capacity.

Research Constraints

- Lack of suitable drought resistant, short duration, high yielding varieties of cereals, pulses and guar in kharif season
- Limited expertise available for research in agro-forestry, horticulture and fodder crops
- Limited knowledge and literature available for post harvest management activities for the crops
- Negligible research facility in biotechnology including tissue culture
- Little information on cropping system based agriculture for different agro climatic conditions
- No research in organic farming
- Package of practices for integrated pest management not available for many crops
- The research on efficient use of water saving devices like sprinklers, drip irrigation lacking
- Lack of effective strategy for management of problematic soils

Infrastructural Constraints

- Inadequate spread of retail outlets for agriculture input (one outlet per 2450 persons) - irregular concentration
- Poor banking facilities (6.5 banks for 1 lakh population upto September, 1996)
- Inadequate supply of power
- Lack of post harvest marketing and processing infrastructure support like cold storage, grading, washing, cleaning, waxing, packaging and container services
- Farm mechanisation is slow
- The road connectivity is around 55 per cent of the country's road length per 100 sq. km.
- Wide gap between demand and supply of veterinary personnel and non-organised animal market
- Poor infrastructure support for horticulture and vegetable crops including marketing

7.5 Out of the total area of 3.42 lakh sq. km. nearly half is under cultivation with an average crop intensity of 125 per cent. As per the land use classification, 14.8 per cent of land is culturable waste, 13.2 per cent fallow land, 7.6 per cent barren, 7.5 per cent under forest, 6 per cent under pasture and grazing land and 5 per cent is put to non-agricultural uses.

Review of the Ninth Five Year Plan

7.6 The cropwise analysis shows reasonable growth in foodgrains particularly in wheat and high growth rate in oilseeds particularly soyabean and mustard. Under oilseed not only has increased area under crops but the average yield of the crop has also increased. Under foodgrains the productivity is showing an upward trend, particularly in the case of wheat which is the dominant cereal crop in rabi season. The increasing trend in productivity has been observed in the following crops :-

Crop	Productivity in Kg./Ha			
	VI Plan	VII Plan	VIII Plan	IX Plan
Foodgrain	634	658	845	980
Cereals	718	742	1002	1177
Pulses	418	404	456	487
Oilseeds	537	671	812	861
Wheat	1642	2053	2340	2530
Rape and Mustard	758	875	891	861
Sugarcane	40246	41159	47543	46764
Linseed	382	360	402	556
Gram	665	702	722	767
Cotton	215	285	335	259

7.7 Main highlights of achievements are as under :

- Rajasthan ranks first in the country in the production of Bajra, Moth, Mustard, Coriander and Guar.
- State ranks second in the production of Barley, Gram & Castor.
- Rajasthan is the third producer in the country in Soyabean & Garlic.
- Per Capita annual foodgrain availability of 196 Kg. in the State is higher than the national figure of 152 Kg.
- Rajasthan is the only State in the country where more than 1.62 lakh Sprinklers are in operation for irrigation purpose.
- About 1.5 tonnes increase in use of unproved seed during IX Plan. Average of 4.70 lakh qtls. as compared to 3.06 lakh qtls. of the VIII Plan period. Rajasthan ranks on fourth position in certified seed production at country level.
- Extention services of the State Deptt. of Agriculture has received productivity award from NPC for the year 1997-98 & 1998-99.

Policy Intervention and Strategy for Tenth Five Year Plan

7.8 In the Tenth Five Year Plan the natural endowment constraints like climate, problematic soil, saline water, arid lands, low rainfall (late arrival and early withdrawl) will continue to influence the growth of agriculture sector. Social constraints viz. rapid growth in population, wide spread illiteracy, large number of small and marginal farmers and technological gaps have reduced the capacity of farming community to struggle with the problem of unstable production. Therefore, interventions required for sustainable development of agriculture in the State would continue to depend largely on efficient management of land, water technology adoption extension management, research and development in seed sector, value addition in crops and increasing infrastructural support.

Strategy

7.9 The strategy for achieving equitable development of agriculture and sustainable agriculture growth have to revolve around the following core areas:

- Attracting larger public and private investments in the development of Natural Resources and building up community infrastructure support
 - * Facilitating private entrepreneurs to setup agro-industry, technology park, high tech demonstration and production farms
 - * Collaborative area specific extension support to new firms/units entering in the promotion of agriculture marketing agro industries and value addition.
 - * Encouraging private sector to take over the delivery of goods and services and production of non traditional input like bio-fertilisers, bio-agents, gypsum.
 - * Encouraging financial institutions to take over the administration of supplies available for on-farm infrastructure development
- Mobilising large scale credit flow to operators on farm infrastructural development and expanding pledging facilities on farm produce and other crop loan, institutional support mechanisms.
- Programmes addressing the need of resource poor farmers for equity with greater focus on small, marginal and women farmers
- To strengthen agricultural extension and delivery system, agriculture information management , education and co-ordination system
 - * Involvement of local people and NGOs in extension activities and core areas of development
 - * Strengthening institutional infrastructure for skill upgradation and training of farming community, extension machinery and technical manpower
 - * Strengthening seed village and seed production programme to ensure production and availability of quality and improved seeds both in private and public sector
 - * Strict vigil on quality aspect of input supply
 - * Collaborative and contractual research on location specific, crop specific technology, indigenous technological knowledge, gender specific technology research catering to the need of extension services provided to farmers
 - * Potential use of multimedia including electronic and print media in agriculture extension.

Specific Intervention

7.10 Specific attention needs to be given to the following core areas

Using natural resource endowment on sustainable basis

Land Management

- Adoption of dry farming technologies to augment agriculture production in rainfed areas, comprising about 70-75 percent of the total cropped area.
- Adoption of agro-social forestry programmes extensively for development of waste lands/fallow lands.
- Land be treated on watershed basis.
- Amelioration of soil health through use of biofertilizers and organic/green manure along with balanced use of chemical fertilizers. Integrated pest management approach will continue and subsidy on bio-pesticides/bio-agents will be provided @50% upto Rs. 600 per hectare.

- Putting the land(Class IV and above) under suitable grasses legume/fodder trees and crops and integrating with animal productive system. Alternate use of land as agro-forestry /Silvi Pectoral System/Farm Forestry/Alley Cropping will be promoted.

Water Mangement

7.11 Water is a scarce and vital input for crop production and needs to be judiciously used. Strategies proposed to be adopted for efficient use of water would consist of:

- Water budgeting and crop planning in command areas of minor/medium/major irrigation projects.
- Crop diversification to get higher return per unit of water used.
- Minimising conveyance losses by laying of pipelines/lining of field channels.
- Judicious use of ground water through sprinkler /drip irrigation system.
- Ground water exploitation in white zone through tubewell/dugwell and promoting community use of water.
- Plasticulture: Use of plastic in agriculture to minimise friction losses and to have efficient water conveyance and application in field through use of plastic(PVC/HDPE) pipe for water conveyance and sprinkler/drip irrigation system and soil mulching to conserve moisture.

Crop Diversification

- Emphasis will be on growing low water duty crops i.e. pulses/oilseeds as compared to cereals to harness highest return per unit of water.
- Expansion of area under soyabean,castor,safflower and sunflower.
- Promoting oilseed cum soil stabilizer crops like Tumba in western part of the State.
- Alternate land use and mixed farming in fragile eco-system
- Crop rotation mix cropping and inter cropping based approach
- Financial assistance to Agriculture Research Stations for promoting and improving the capacity of locally available cultivators to maintain bio-diversity in the State.

Developing infrastructural and institutional support in rural areas.

7.12 Emphasis will be given for making available inputs, viz seeds, fertilizers & plant protection chemicals at the door steps of the farmers, or in the vicinity of their homes, through retail outlets in each village. Wherein seeds at subsidised rates to the extent of (15% maximum to Rs. 20000 per year or which ever is less) for the period of first three years & funds for arranging institutional finance (at the rate of 25000 per outlet) for carrying out seed & fertilizer business will be provided. Beside these efforts will be made to provide improved seeds, through developing more seed villages in the State.

7.13 Presently major share of crop loaning is by Central Cooperative Bank and the contribution of commercial bank is dismally below 7 percent and so farmers are not getting crop loan in time. The State Government will facilitate timely credit availability through various financial institutions.

7.14 The State is subjected to erratic scanty rainfall. Due to aberrant climatic conditions prevailing during a season the production may be adversely affected. It is proposed to cover the risk of failure of crop/lower production by way of crop insurance.

7.15 Special efforts would be made to make extension system more efficient & effective through the work of transfer of technology and its adoption among the farmers by strengthening the existing Kisan Mandals and constituting women Kisan Mandals. For meeting out location specific requirements of farmers Agro Clinic/Kissan Seva Kendra & centre for agro communication would be established. Besides this, distance learning programme through AIR & Door Darshan will also be given due importance for dissemination of technology.

Revitalising emphasis to agriculture research and higher training system.

7.16 Rajasthan Agriculture University and CAZRI are the important institutes conducting research on various aspects of crop production and management. To support the research need and to make RAU an institute of excellence.

Agriculture Production

7.17 The agriculture production programme for the Tenth Five Year Plan has been proposed keeping in view the growing need of population, production potential and climatological constraints.

7.18 The targeted production level, vis-a-vis level obtained during the Ninth Plan are given in table below :

		(Area in lakh ha.)				
		(Production in lakh tonnes/bales)				
		(Productivity kg./ha.)				
	Item	1989-90	1990-91	1991-92	1996-97	Ninth Plan
1 Cereals	Area	87.17	89.71	84.57	89.91	88.94
	Production	73.77	92.13	70.64	108.06	104.66
	Productivity	846	1027	835	1202	1177
2 Pulses	Area	29.40	36.82	28.31	38.34	35.46
	Production	11.55	17.22	9.17	22.13	17.28
	Productivity	393	467	324	577	487
3 Foodgrains	Area	116.57	126.53	112.88	128.25	124.40
	Production	85.32	109.35	79.81	130.19	121.94
	Productivity	731	864	707	1015	980
4 Oilseeds	Area	25.33	30.90	35.55	39.71	36.95
	Production	18.45	23.53	27.08	40.49	31.81
	Productivity	732	761	762	1020	861
5 Sugarcane	Area	0.16	0.23	0.31	0.27	0.18
	Production	7.16	12.01	13.60	12.90	8.32
	Productivity	45821	52644	43871	47778	46764
6 Cotton	Area	4.34	4.55	4.74	6.54	5.46
	Production	9.86	9.18	8.45	13.63	8.32
	Productivity	386	343	303	354	259

7.19 For achieving the above targets, the level of inputs proposed to be applied by the end of Tenth Five Year Plan have been targeted as under :

Item	Level achieved during Ninth Plan	Target Tenth Plan
1. Cropped Area (lakh ha.)	203.80	212.50
2. High Yielding Varieties		
a. Area under HYV (lakh ha)	42.1	50.60
3. Seeds distribution including HYV	400639	538500

seeds (qtls)		
4 Fertilisers		
a Total Consumption (000 tonnes)	958.19	1032.60
b Consumption per Hectare(Kg)	47.52	48.59
5. Distribution of Rhizobium Culture Packets (lakh no.)	20.0	32.50
6 Plant Protection Measures		
a Area Covered (lakh ha.)	97.14	82.50
b Consumption of Technical Grade Material (tonnes)	3000	3100

Research & Education

Rajasthan Agriculture University: Bikaner

7.20 The Rajasthan Agriculture University Bikaner was established in 1987 to look after Agriculture Extension, Education and Research and to carry out production - oriented agriculture research programmes, rural mass education, adoption and propagation of new technologies in the State in the field of Agriculture including Animal Husbandry and allied services. In the year 1999-2000 one more Agriculture University has also been established at Udaipur with a view to watch the interest of Agriculture Education and Research more effectively in souther and eastern zones of the State with these two agriculture universities in the State, 21 districts will be served by RAU, Bikaner, whereas remaining 11 districts will be covered by Agriculture University, Udaipur.

7.21 The University has four constituent Colleges including 2 Agriculture Colleges, one college of Home Science and one college of Veterinary Animal Science. The intake capacity of Educational Institutions of this University is around 500. Presently 1073 students are studying at UG level, 233 students at PG level and 83 students at Ph.D. level.

7.22 Research is being conducted in different agro-climatic zones through its 7 Agricultural Research Stations (ARS) and 6 Agricultural Research Sub-stations. The Agricultural Research Stations conduct research through All India Coordinated Research Projects financed by ICAR on 75:25% basis.

7.23 Extension activities carry research from laboratory to field through 13 Krishi Vigyan Kendras located in various districts of the State which are under the control of the Directorate of Extension Education of the university. These KVK's organise institutional training camps for farmers.

7.24 For achieving sustained growth of agriculture in the State during the X five year plan period, the strategy for agricultural research prioritization must be based on improving crop yield ceilings in irrigated areas while stabilizing crop yields in rainfed areas. Even if all possible measures of water resources development are accomplished in the future, more than 60 percent of cultivated area will always remain rainfed in the State. Therefore, the future gains in agricultural production in the State will have to be achieved from rainfed agriculture. Besides, food needs of increasing population, there is an equally pressing issue of ensuring fodder security for the vast livestock population in the State.

7.25 In the changing scenario of agriculture under WTO regime with the opening of world wide, the agricultural development in the State has to be viewed from an-agri-business perspective. For accelerated agricultural progress and rural progress and rural industrialization in the State, therefore, the concept of raming must shift from subsistence based activity to one characterizing agriculture as an enterprise, a business. We should also not lose sight of the fact that about two thrid of the employment is provided by agriculture and a large segment of our export earnings comes from this sector. In order to further make this agricultural sector viable and vibrant, continued emphasis on research is imperative, else technological stagnation will bring the agricultural and rural development process to a halt. The role of research in sustaining agricultural development in the State is, therefore, more crucial now than ever before.

7.26 Following are the specific areas in which research thrust needs to be given for improving agriculture in Rajasthan :-

1. Integrated Farming System Research
2. Development of Drought Proofing Package
 - i) Development of short duration, drought resistant / water use efficient varieties of crops.
 - ii) Rainwater conservation, harvesting and recycling
 - iii) Crop Management under aberrant Weather Conditions
3. Water shed based research
4. Irrigation Water Management
5. Horticultural Crops research including seed spices and medicinal plants.
6. Post-harvest technology and value addition
7. Integrated pest management
8. Integrated nutrient management
9. Institute for research on sustainable land use and water management in IGNP Command
10. Home Science Research

Agriculture Education

7.27 The Agriculture and Veterinary & Animal Science Education network established and developed in the state of Rajasthan was basically to meet the educational needs required for the set goals of self-reliance and self-sufficiency in agriculture and livestock sector. With the process of globalisation and World Trade Agreement on agriculture, there is need to reset the goals of agriculture education in the state since the challenges emerging from agriculture sector have become more complex and complicated. Therefore, the goals of agriculture set for education for the Tenth Five Year Plan may include -

- i) Modification, strengthening and reorienting existing agriculture education programmes to meet the new challenges and opportunities.
- ii) To bridge the gaps caused due to the bifurcation of RAU into two SAUs to cater the varied agro-climate needs of the state.
- iii) To initiate new frontier areas of learning so as to meet the man power requirement in specialized areas.
- iv) To establish centres / departments of excellence of learning in potential areas such as horticulture and forestry, biotechnology, fisheries, agribusiness management etc.

7.28 During Tenth Plan an outlay of Rs.1078.01 lakhs has been kept and for Annual Plan 2002-03 and an amount of Rs.168.75 lakhs has been kept as State matching share for ICAR schemes.

Agriculture University, Udaipur

7.29 The Agriculture University, Udaipur came into operation from 1st November, 1999 after carving out of RAU, Bikaner. The districts of Udaipur, Chittorgarh, Rajsamand, Bhilwara, Banswara, Dungarpur, Sirohi, Kota, Bundi, Baran and Jhalawar have been included in the jurisdiction of Agricultural University, Udaipur.

7.30 The newly created agricultural university has well established facilities of agricultural education in the areas of Agriculture, Agricultural Engineering, Home Science, Dairy & Food Science. It has a Directorate of Extension Education, 10 Krishi Vigyan Kendras, 3 Agricultural Research Stations, 3 Agricultural Research sub-stations and a Livestock Research Station located in these districts.

7.31 An amount of Rs.1041.45 lakhs has been kept for this university for Tenth Plan and Rs.152.99 lakhs for Annual Plan 2002-03 as State matching share for ICAR supported schemes.

Agriculture Department :

7.32 An outlay of Rs.5703.29 lakhs has been provided for the Tenth Five Year Plan and Rs.1018.78 lakhs for 2002-03.

Direction and Administration

Establishment of fertilizer and Pesticide testing lab at Sri Ganganagar

7.33 Looking to maximum use of fertilizers and pesticides in Sri Ganganagar division and to check the quality of inputs in the area, it is proposed to establish a new fertilizer and pesticide testing laboratory at Sri Ganganagar during the Tenth Plan period for which a provision of Rs. 130.75 lakhs is made during the Tenth Plan for staff cost and establishment of laboratory.

Seeds

7.34 An amount of Rs. 104.60 lakhs has been kept in Tenth Plan for meeting out committed liabilities of retail outlets. Opening of new retail outlets of agriculture inputs particularly seed in the remote rural areas, so as to make these inputs available to the farmers well in time for the sowing season. Production of improved seeds of promising varieties at village level itself and provision of furniture/fixture, telephone and lab. equipment (seed germinator) under seed Testing Labs Durgapura & Kota respectively, are proposed. Seed production at village level, support for seed production, use of Improved Certified seed of Guar / Maize, buffer stock of certified seed by RSSC and protection and improvement of local seed material. A provision of Rs.19.02 lakhs has been made for Annual Plan 2002-03 for above items.

Manures & Fertilizers

7.35 A provision of Rs. 110.10 lakhs has been proposed for manures and fertilizers mainly for popularising use of bio-fertiliser / bio-agents and privatisation of Agriculture Services during Tenth Plan. Similarly, Rs.20.02 lakhs has been made for Annual Plan 2002-03 for these items.

Innovative Programme, Contractual research & Bio-techniques etc:

7.36 A provision of Rs. 11.00 lakh during Tenth Plan has been proposed for innovative programmes and contractual research. This is to meet the requirement of research and extension for specific farming situations. Core budget will permit taking up of any new schemes or programmes and bio diversity conservation. Similarly Rs. 2.00 lakhs has been made for annual plan 2002-03 for these items.

Plant Protection

7.37 A provision of Rs. 165.00 lakhs has been provided for the Control of Pests & diseases like Katra, white grub, white fly etc. in endemic areas and Weed Control for Tenth Plan and Rs.30.00 lakhs for Annual Plan 2002-03.

Commercial Crops:**State Matching Share for CSS:**

7.38 A provision of Rs. 3283.27 lakhs during Tenth Plan has been provided for State matching share towards various centrally sponsored schemes on Cotton, Pulses and Oilseed Development, ICDP Coarse cereals & Wheat, Sugarcane Dev., Maize. Similarly, Rs.596.95 lakhs has been kept for Annual Plan 2002-03 for these items.

Extension & Training

7.39 The work of transfer of technology & its adoption among the farmers has taken new dimension and has become a challenging task with globalisation of agriculture. This phenomenon & growing sophistication in agriculture due to the multi-farm activities, has led to adoption of a holistic view of the farming system approach. Therefore, attention will be paid to human resource development with emphasis on training & upgradation of technical, managerial, communicational & organisational skills of the field extension personnel. During Tenth Plan and Annual Plan provision has been made for Training of Staff and education / demonstration of minikits / field day, Agriculture Information / Agriculture Extension Services etc. Details are as under :

Agriculture Information:

7.40 An amount of Rs. 203.50 lakhs during Tenth Plan has been provided towards operating cost of Agriculture Information unit for advertisement and publicity of Agriculture Information & Agriculture Technology through exhibition and agriculture information activities at sub-district, district division and State Level. For 2002-03, a provision of Rs.37.00 lakhs has been made for this purpose.

Training of Staff & Education :

7.41 A provision of Rs. 272.25 lakhs has been provided for institutional trainings & studies for developing communication skill, social research and studies on dissemination of technology, adoption process and feed back mechanism during Tenth Plan & Rs 49.50 lakhs for Annual Plan 2002-03.

Demonstration / Minikits / Field Days :

7.42 A provision of Rs. 375.00 lakhs has been provided for crop demonstration and minikit through which demonstrations on various aspects of agriculture technology would be laid out such as inter-cropping / green manuring, long term crop rotation based demonstration, dry farming demonstrations fodder demonstration, crop diversification for sustaining agriculture production. Soil health and promotion of organic farming, efficient use of fertilisers, micro nutrients,

and bio fertilisers etc. A provision of Rs.50.00 lakhs has been proposed for Annual Plan 2002-03 for these items.

Effective extension (Mobility of field officers)

7.43 For effective extension services and execution of all extension activities including rapid roving survey for crop surveillance and inspection work it is proposed to keep a provision of Rs. 50,000/- for each sub-district/district/Regional level officers. A sum of Rs. 100 lakh is made during Tenth Five Year Plan.

Agriculture Extension Services :

7.44 A provision of Rs.550.00 lakhs has been proposed for various field extension activities for Tenth Plan and Rs.100.00 lakhs for Annual Plan 2002-03.

7.45 The various activities covered under this, are as under :

- (1) Strengthening of Kisan Sewa Kendra at Gram Panchayat level @ Rs.5000/- per KSI.
- (2) Adoption of villages.
- (3) Need based extension
- (4) Women Training & Education Programme
- (5) Rent for Kisan Sewa Kendra.

Agriculture Engineering

7.46 A provision of Rs. 55.00 lakhs as committed liability has been provided for popularisation of improved agriculture implements amongst farmers for Tenth Plan and Rs.10.00 lakhs for Annual Plan 2002-03

Water Management - Water Budgeting

7.47 A provision of Rs.27.32 lakhs has been provided for water budgeting which includes subsidy on sprinklers, piped conveyance, diggies, well recharge and drip system etc. during Tenth Plan. Water being the important and precious input for Crop Production, its judicious use is of paramount importance and this input will continue to be in the priority list of the State policy of harnessing & utilising this important resource to its optimum use. This amount has been kept only for 2002-03 for clearing pending liabilities of piped water conveyance and continue well recharge and drip system programmes.

Failed Well Compensation Schemes

7.48 A token provision of Rs.0.05 lakh & Rs.0.01 lakhs has been provided for failed well compensation & well insurance programme during Tenth Plan and Annual Plan respectively. The aim of this programme is to provide cover to the farmers against the risk of his well failure & to help development of Ground Water in a planned manner. This scheme was introduced during 1990-91 & a Corpus Fund was created with a provision of Rs. 1.00 Crore. For the execution of scheme the draft proposal is under consideration of the State Government.

Reclamation of Saline/Alkaline Soil

7.49 A token provision of Rs.0.05 lakhs has been provided for the reclamation of problematic soils spread over in districts of Bhilwara, Chittor, Alwar, Bikaner, Pali, Nagaur, Bharatpur, Ajmer, Jaipur, Sikar, Dholpur & Jalore for the Tenth Plan. While a token provision of Rs. 0.01 lakhs has been proposed for Annual Plan 2002-03. The necessary soil amendments for treating the problematic soil will be made available to the farmers at subsidised rates.

Crop Insurance

7.50 A provision of Rs.0.15 lakhs and 0.03 lakhs is provided during Tenth Plan period and Annual Plan 2002-03 as a token provision towards Government share for the implementation of Crop Insurance Scheme.

Civil Works

Civil Works through PWD :-

7.51 A provision of Rs.143.40 lakhs has been provided for various ongoing and new civil works for Tenth Plan period while Rs.43.40 lakhs has been proposed for ongoing civil works during Annual Plan 2002-03.

Civil Works through Department :-

7.52 A provision of Rs.130.00 lakhs has been provided for various ongoing and new civil works i.e. construction of Kisan Sewa Kendras, General repairs and maintenance of AAO / VEW residence quarters for Tenth Plan period and Rs.30.00 lakhs for Annual Plan 2002-03.

Lab equipment and Machinery

7.53 A token provision of Rs. 0.01 lakh is proposed during 2002-03 towards Government share for necessary instrument/equipment and accessories parts for seed testing/Quality control/Soil testing /bio-fertiliser lakhs and traing centre. A provision of Rs. 30.05 lakkh is made during Tenth Five Year Plan.

HORTICULTURE

7.54 Rajasthan is a state of varied soil agro-climatic situations, where tropical and sub-tropical fruits and vegetables can be successfully grown. These besides being wholesome supplier of vitamins and minerals to human beings, are also helpful in improving the environmental conditions, check pollution and develop aesthetic sense in human beings. Horticulture, being labour intensive also, offer vast scope for providing additional employment opportunities and can also be instrumental in diversifying the rural economy in areas of agro-processing and other ancillary units.

7.55 During 1999-2000, 5.89 lakhs hectare area was under horticultural crops. This includes 0.20 lakh ha. under fruit crops, 0.91 lakh ha. under vegetable crops, 3.68 lakh ha. under spices and 1.09 lakh ha. under medicinal and aromatic crops. At present fruit crops cover only 0.09% vegetable 0.43% , spices 1.72% and medicinal covers 0.51% of the cultivated area. Thus presently only 2.75% of total cultivated area are under horticulture crops.

7.56 Area and production under vegetable crops have been significantly increased during 9th plan period and their are vast scope for future. Similarly area and production of spices has gone up during 97-98. Rajasthan has dominating position in seed spices production by sharing 54% in Coriander, 56% in Cumin, 15% in Fennel and 80% in Fenugreek production of the country. Rajasthan has also started export of seed spices. Therefore, shifting from Agriculture to Horticulture crops needs to be emphasised for which incentive and technological support is required to be provided by the State Govt. under the State Plan.

7.57 At present a total of 20 districts out of 32 have been covered under intensive horticulture development programme and in remaining 12 districts the horticultural programmes are being implemented with the help of agriculture department of the State.

7.58 On the basis of Soil type , average rainfall , Rajasthan State has been divided in 10 agro-climatic zones. Following Horticultural crops are recommended in the zones for successful cultivation.

Agro-climatic Zones	District Covered	Soil type	Average rainfall (mm)	Fruit Crops recommended
I-a (Arid Western Plain)	Barmer and Jodhpur	Desert Soil & Sand dunes	100-300	Ber, Pomegranate, & Aonla
I-b (Irrigated North Plain)	Ganganagar, Hanumangarh	Loamy to Silty Clay loam, Calcareous in nature	100-300	Malta ,Kinnow and Grapes
I-c (Hyper arid partially irrigated Western Plain)	Jaiselmer, Bikaner and Part of Churu	Desert Soil & Sand dunes	100-300	Ber, Pomegranate, Datepalm & Aonla
II-a (Transitional Pain of Inland Drainage)	Nagaur, Sikar, Jhunjhunu and Part of Churu	Desert Soil	375-560	Ber, Pomegranate, Lime, Guava and Grapes
II-b (Transitional Pain of Luni Basin)	Pali, Jalore and Sirohi	Sandy and Hilly Soils	300-500	Ber, Pomegranate ,Lime and Mehandi
III-a (Semi Arid Eastern Plain)	Jaipur, Ajmer, Tonk and Dausa	Seirozones	300-500	Ber, Guava, Aonla, Lime Pomegranate,
III-b (Flood Prone Eastern Plain)	Alwar, Bharatpur, Dholpur, Sawai Madhopur, Karauli	Alluvial Black and Yellowish	600-700	Ber, Guava , Lime, Mango, Papaya
IV-a (Sub Humid Southern Plain and Aravali Hills)	Udaipur, Chittor, Bhilwara, Rajsamand	Yellowish Brown Hilly Soils with Medium Black	500-700	Guava, Lime, Aonla, Custard Apple
IV-b (Humid South Plain)	Dungarpur, Banswara	Deep, Medium Black, Red Loam and Hilly Soils	750	Lime, Papaya, Banana, Sapota, Mango
V (Humid South Eastern Plain)	Kota, Bundi, Baran, Jhalawar	Yellowish Brown Medium Black with Hilly Soils	750	Aonla, Guava, Mango , Lime, Santra, Sapota

7.59 As far as cultivation of Vegetables is concerned , almost all vegetables are being grown in each and every agro-climatic zones of the State. Rajasthan is also a pioneer state in seed spices cultivation and the major spices of the state are Coriander, Cumin , Fenugreek, Fennel and Chilli. Some Districts such as Jhalawar, Barnam and Kota are having major area under Coriander whereas Jalore, Barmer, Jodhpur, Nagaur and Pali are leading in Cumin Production. Fenugreek is widely grown in Kota, Jaipur, Sikar, Nagaur, Baran and Jhunjhunu. While the production of Chilli is higher in Jodhpur, Pali, Ajmer, Tonk , Dholpur , SawaiMadhopur and Karauli.

7.60 Medicinal and Aromatic Crops are also known to be the most promising area of development in the state and Isabgol is being grown in about 1.0 lac ha. Area in Jodhpur division. Some other crops like Sonamukhi and Aswagandha are also coming up in the State.

STRATEGY & PRIORITIES FOR TENTH PLAN

7.61 Looking the vast area and ample scope for horticulture development in the state, efforts will be made for popularising horticulture activities among farmers during tenth plan in order to promote, develop, diversify horticulture and agro based industries.

7.62 During Tenth Five Year Plan , horticulture department will give priority to the following aspects.

- To expand the area under horticulture crops like fruits, vegetables, spices and medicinal and aromatic plants etc.
- To increase availability of quality seed / planting material .
- Transfer of Technology.
- To popularise the water saving devices particularly through drip installation system.
- To enhance production and productivity of different horticultural crops.
- To create better opportunities for self employment.
- Emphasis on plant protection and quality control of horticulture inputs.
- Export enhancement.

7.63 During Tenth Five Year Plan a provision of Rs. 145.75 lacs has been made for development of horticulture and for Annual Plan a provision of Rs. 26.50 lacs has been made.

7.64 Details of various schemes to be undertaken during Tenth Plan and Annual Plan 2002-03 are summarised below:

COMMITTED PROGRAMMES

Distribution of Onion Vegetable Demonstrations To S.C.Farmers

7.65 In order to propagate onion production technology and supplement the additional income to S.C. farmers in the State. Rs 22.00 lacs and Rs. 4.00 lacs have been proposed to layout vegetable onion demonstration during Tenth Five Year Plan period and 2002-2003 respectively.

Assistance on P.P. Measures

7.66 The prophylactic / control plant protection measures for the horticulture crops such as fruits, vegetables, spices, medicinal and aromatic plants, flowers,

betelvine etc. are quite important, but it involve high expenditure. As such 50% assistance on the cost of pesticide upto maximum of Rs. 300/- per ha., is proposed under this programme. For Tenth Five Year Plan period and 2002-2003 49.50 lacs and Rs. 9.00 lacs have been proposed respectively. During 2002-03 , out of Rs. 9.00 lacs, Rs. 0.5 lacs is for TSP areas.

Training to Farmers / Hali/Mali /Udyan Sakha and owners of private nurseries

7.67 For imparting training to Farmers, Hali/Mali / Udhyan Sakha and owners of private nurseries of various aspects of horticultural crop production an outlay Rs. 2.00 lacs proposed for the year 2002-03. However, for Tenth Five Year Plan period, Rs. 11.00 lacs only has been proposed.

Legal and Court Cases

7.68 To meet out the liabilities in the form of payment of Rs. 60/- per day Hali/Mali etc. Working at nurseries in the state as per direction of various courts, it is proposed to keep a provision of Rs. 8.25 lacs under Tenth Plan and Rs. 1.50 lacs under Annual Plan for 2002-03.

NEW PROGRAMMES

Publication, Literature, Information and Media Support

7.69 For organisation of exhibition, shows, printing of literature, Organisation of Workshop and upgradation including printing of package, running & maintenance of Audio Visual aids and photocopiers, and bearing cost of NIT, AMC, minor repair and purchase of raw materials thereof. For for Tenth Five Year Plan period and for Annual Plan 2002-03, Rs. 9.62 lacs and Rs 1.75 lacs have been proposed respectively.

Revitalisation and Development

7.70 For safety, security, sanitation, cleanliness and maintenance of Govt. buildings, maintenance of campus lawn and garden and repair and maintenance of Govt. buildings such as upkeep of building, minor repair, whitewash sanitary fitting etc. For for Tenth Five Year Plan period and for 2002-03, Rs. 11.00 lacs and Rs 2.00 lacs have been proposed respectively. These works will be carried by contracting out the works

Quality Control of Inputs

7.71 Presently there are 19 Insecticide Inspectors in the Department of Horticulture. Further, in compliance to the direction of Hon'ble Agriculture Minister, Government of Rajasthan, proposals are being submitted to the State Government of declaration/notification of 24,24 & 5 additional Inspectors for seed, fertiliser, pesticide respectively. But currently there is no provision for sampling material and sample cost etc. Thus, for taking samples of seed, fertiliser and pesticides for Tenth Five Year Plan period and for Annual Plan 2002-03, Rs. 5.50 lacs and Rs 1.00 lacs have been proposed respectively.

District Salahkar Samities

7.72 For more effective representation of farmers in formulation of need based programmes and effective implementation thereof, a district level salahkar samitie will be constituted in all 20 districts. It will be represented by innovative farmers who would elect one of them as President and Assistant Director Horticulture will be Member secretary of the Samiti. D.S.S. will be provided with Rs.10,000/- for

implementation of local need based programme. For this purpose Rs. 11.00 lacs and Rs. 2.00 lacs have been proposed during Tenth Five Year Plan period and 2002-03 respectively.

Rent for AAO offices and office of AS/ Udyan Seva Kendra

7.73 In Department of Horticulture there are 67 AAOs and 198 ASs. In parallel Department of Agriculture rent is admissible for AAO office and office of AS/ Kisan Seva Kendra @ Rs 150/month and Rs 100/month respectively. But in Horticulture Department there is no such provision of rents. On the wake of Agriculture Department may consider to provide rent on the same pattern. For this purpose Rs. 17.88 lacs and Rs. 3.25 lacs have been proposed during Tenth Five Year Plan period and Annual Plan 2002-03 respectively.

Rajasthan State Warehousing Corporation :

7.74 Rajasthan State Warehousing Corporation (RSWC) is a Government undertaking. The main objective of the Corporation is to construct godowns and warehouses in the State for scientific storage of agricultural produce, fertilizer, seeds and other notified commodities.

7.75 For Tenth Five Year Plan a provision of Rs.1200.00 lakhs and for Annual Plan 2002-03, a provision of Rs.210.00 lakhs has been kept.

Watershed Development & Soil Conservation

7.76 Soil erosion is the most serious and widely prevalent threat to productive land in the State. Productive land is a source of human sustenance and security. It is a non-renewable resource which provides the essential social environment in terms of shelter, roads and other land based facilities. Soil in Rajasthan are also subject to heavy moisture loss by quick evaporation. Uncontrolled run off not only result in loss of water and good top soils, but also in loss of valuable soil nutrient.

7.77 Fertility of soil in rainfed areas can be considerably increased by adopting appropriate soil & water conservation measures.

7.78 With the establishment of Watershed Development & Soil Conservation Department in 1991, Rajasthan has been making rapid strides in development of participative, replicable, sustainable, ecological & Low cost resource management for Watershed Development & Soil conservation, Management of Common Property Resources by elected User Committees and introduction of Gopals for the live stock development. These have been Rajasthan's innovations in development of rainfed agriculture in the country. The approach adopted has interested several international agencies.

7.79 Empowerment of a User Committee had been a major thrust area since 1995-96. In this approach instead of getting works executed through the Government machinery, a committee of the beneficiaries executes the developmental works. These committees are popularly known as Users Committees. The User Committee is elected in general meeting of the village community and is responsible for finding solutions of problems through interaction with Government officials. Presently there are about 15000 Users Committee functioning in the State. The department now has also operationalised bank

accounts of User Committee and all payments are cleared through bearer cheques to avoid any misunderstanding.

7.80 The main objectives of the department are given below:

- Conservation, upgradation and utilisation of natural endowment in an integral manner. Perpetual availability of food, fodder, timber and other bio mass to meet growing demand of human & live stock population in the rural areas.
- Generation of massive employment during and after project completion.
- In-situ moisture conservation to ensure availability of water.
- Reduction of inequality between irrigated and rainfed areas.
- Development of a natural resources base, sustainable productivity and to improve the well being of millions of poor farmers and landless labourers, to endeavour restoration of ecological balance and to arrest & revise the process of environmental degradation by soil & moisture conservation in an integrated manner.
- To encourage people as well as involvement of Non Government Organisation

7.81 For fulfilling the above objectives the following activities are under taken:

- Establishment of vegetative barrier along the contour to prevent soil erosion and conservation of moisture.
- Plantation of fuel and fodder trees and raising improved grasses to develop the waste and private land.
- Drainage line treatment by constructing loose stone check dams, random rubble check dams, brush wood check dams supported by planting of vegetative material.
- For improving the economical status of cultivator mixed horticulture cropping is taken on farmers field.
- To layout demonstrations on farmers field for transferring the technology of improved dry farming practices on crops and fodder.
- To take up Animal husbandry, Sheep & Wool Development programme to meet out the deficit of milk, meat & wool.
- Treatment of problematic soil by suitable methods.
- Construction of village rural links, tanks, chetna kendras, medium & minor harvesting structures.

Tenth Five Year Plan

7.82 During Tenth Plan period, Rs.31543.91 lakhs will be provided for various schemes of Watershed Development & Soil Conservation including soil conservation through Forest Department and Rs.125.63 lakhs for Annual Plan 2002-03 which have been summarised as under :-

State Plan Scheme

Strengthening of Soil Conservation Units

7.83 The soil conservation work is being carried out on the basis of watershed approach. A provision of Rs.223.91 lakhs have been kept for Tenth Plan. Rs.31.62 lakhs have been kept for meeting out pending liability of incomplete buildings during 2002-03.

NABARD :

7.84 Under NABARD 100% grant will be available for capacity building phase and 100% loan will be made available under full time implementation phase.

Under CBP phase 10% area i.e. 100 ha block out of 1000 ha watershed @ Rs.5000/- per hac. i.e. Rs.5.00 lakh per CBP have been kept as grant and rest Rs.45.00 lakhs have been kept for FIP as loan component. About 10 CBP have been proposed for the year 2002-03 and FIP phase will be from 2003-04 to 2006-07 and 10 CBP during 2003-04 have been proposed for which the FIP period will be 2003-04 to 2007-08. As per guidelines grant will be 33% and loan component will be 67%.

7.85 Thus a token provision of Rs.50.00 lakhs for 10CBP has been proposed for the year 2002-03 as 100% grant whereas Rs.1000.00 lakhs have been proposed for the Tenth Five Year Plan.

Special New Watershed Development Project :

7.86 Provision of Rs.30100.00 lakhs have been kept for Tenth Plan for new projects which depends on sanction of the projects. A provision has been kept of Rs. 0.01lakh for Annual Plan 2002-03.

Work Plan :

7.87 Under this scheme, all 27 Centrally Sponsored Schemes supported by Ministry of Agriculture, Government of India have been subsumed in the Work Plan. The Government of India share would come as 80% grant & 20% loan to the state Government. The provision of Rs.6425.10 lakhs during Tenth Plan and Rs.1168.20 lakhs during Annual Plan 2002-03 has been proposed for Work Plan.