

DRAFT

STATE AGRICULTURAL

POLICY

**PLANNING DIVISION, COMMISSIONERATE OF AGRICULTURE, RAJASTHAN,
JAIPUR**

DRAFT STATE AGRICULTURAL POLICY

1. PREAMBLE:

The State of Rajasthan is unique in many ways. It is known not only for its valour and famous historical places but also for its rich culture, traditions and color as well as its biodiversity comprising both plants and animals. Rajasthan is currently the largest State of India covering nearly 10.4 per cent of total geographical area of the country. Nearly 65 percent of its population (56.5 million) is dependent on agriculture.

The State is presently divided into 33 administrative districts and has 10 agro-climatic zones. Agriculture in Rajasthan is primarily rainfed covering country's 13.27 per cent of available land. Groundwater is getting depleted as well as polluted. In general, every third year is a drought year. Despite these, the State has made significant achievements since independence and has attained self-sufficiency in food-grains, both cereals and pulses. Today, the Rajasthan State is surplus in the production of oilseeds. The State is also rich in its agro-biodiversity and possesses some unique medicinal and aromatic plants as well as seed spices and legumes. Desert trees and shrubs like khejadi, rohida, phog, ker, ber etc. are indigenous to Rajasthan. The State has speciality crops and breeds that are almost exclusive or predominantly belong to Rajasthan. These include crops like moth, guar, coriander, cumin, fenugreek, isabgol, mehndi, and breeds such as Rathi, Tharparkar, Kankrej, Gir, and Nagauri cattle; Magra and Bikaneri Chokla sheep; Marwari goat and others. Nevertheless, there is a need to capitalize on available potential of Rajasthan agriculture that remains yet untapped. In this context, therefore, revitalization of agrarian economy in Rajasthan is warranted.

2. SCENARIO:

Rajasthan has total geographical area of 342.65 lakh ha, of which 26.75 lakh ha is under forests, 42.62 lakh ha not available for cultivation and 63.19 lakh ha is other uncultivable land (excluding fallow land). The total cultivable area is around 220.00 lakh ha. The shrinkage of gross cropped area is evident from the fact that the highest gross cropped area was around 223.25 lakh ha during the year 1997-98.

- The average rainfall of the State is 575 mm, out of which about 532 mm precipitation occurs in the rainy season i.e. June to September. The average rainfall of eastern Rajasthan is about 704 mm and that of western Rajasthan is about 310 mm which reflects a vast variation.

Rivers in Rajasthan are non-perennial except for Chambal and Mahi rivers.

- The average surface water is only 1 percent of the country's water resources. The State has 118 major and medium irrigation projects. The total cultivable command area of the State is 36.46 lakh ha.
- The ground water condition in the State is quite alarming. The condition has deteriorated very fast in the last two decades. Out of 249 blocks in the State, most are in the 'dark zone' and only 40 blocks are in the 'safe category'.
- By the end of X Plan, the State increased its cereal production by more than 2.5 times and the oilseeds production by 3.5 times.

The State enjoys 1st position in the country concerning production of rapeseed and mustard, coriander, cumin, fenugreek, guar and moth, all being unique to the State. Currently, the Rajasthan State has major share in the production of crops like bajra (40 percent), moth bean (85 percent), rapeseed and mustard (51 percent), coriander (66 percent), and fenugreek (87 percent). Coriander cultivation is presently concentrated in the three districts of Kota, Baran and Jhalawar. Cumin is concentrated in the districts of Jodhpur, Jalore and Barmer. Fennel is cultivated mainly in the districts of Jodhpur, Nagaur, Tonk and Sirohi. Sirohi district alone contributes around 40 percent of the fennel area. Fenugreek is mainly cultivated in the districts of Sikar, Jhalawar, Nagaur and Chittor. Nevertheless, increasing the productivity of and profit from these crops is needed for improving the livelihood of farmers.

- The Cropping intensity in the State fluctuates between 106 to 126 percent, which indicates further scope for its increase.
- The livelihood of the resource poor farmers in large part of arid areas in the Thar Desert is mostly dependent on dairy farming as well as around small ruminants like sheep and goat. The State has about 17.07 lakh ha of land under permanent pastures for grazing, and the total livestock population is currently 5.44 crore, which is almost comparable to that of human population of the State. The area under pasture is not able to meet the total fodder requirement of present livestock population.

3. CHALLENGES:

Scanty rainfall, scarcity of water, and the inefficient water management practices constitute the major challenge of the State. Both crops and animals are prone to vagaries of nature. Frequent droughts lead to decline in productivity and reduced performance and even death of animals. Climate change, including global warming, has further aggravated the existing problems of abiotic stresses

in the State. A comprehensive technology-based developmental approach to promote dryland/arid agriculture is missing. Another important impeding factor is the deteriorating soil health including imbalanced use of fertilizers, micronutrient deficiency, lack of organic matter content, inadequate soil microbial flora and fauna etc. The organic matter content of the soils is also very low.

Presently, agriculture has become a relatively unrewarding profession mainly due to low productivity, unfavourable prices and practically very little value addition. In most of the cases, even primary value addition is missing. Practically, there is no commerce in the field of agriculture. The situation is exaggerated further in the wake of globalization of agricultural trade. Carbon trading is a new area from which the State may benefit, especially in the context of massive efforts put in for stabilization of sand dunes and for greening the desert through agro-forestry programmes undertaken by the Government. Mechanisms of export promotion, adherence to sanitation and phyto-sanitation (SPS) standards and measures for minimizing the export rejections are missing in case of several seed spices and industrial crops that have potential for export to other countries. Farmers are not linked to markets. Often there are distress sales. These all lead to non remunerative agricultural endeavours and thus often farmers are dissuaded to continue farming.

Besides increasing the overall system productivity, the challenge is also to appropriately reduce the cost of cultivation. Science led conservation agriculture is lacking albeit some old traditional practices that conserve resources. Modern resource conservation technologies (RCTs) along with the improvised and field-tested indigenous technical knowledge need promotion in the State.

Integrated farming approach is badly lacking. In several regions, cultivation of crops alone cannot provide livelihood. It has to be supplemented by livestock raising, milk production, arid horticulture, fishery etc. wherever feasible. Supplemental livelihood options, including the services in agriculture and rural non-farm enterprises for retaining youth in agriculture are invariably lacking. Although some entrepreneurship development in rural areas has commenced, it is not to the scale desired. The present day challenge is to ensure overall farm prosperity.

Huge yield gaps exist between the experimental yields and those obtained at farm level. Up-scaling of farm-validated modern technologies and agricultural innovations is often lacking. Gender mainstreaming in agriculture is also not up to the desired level.

Despite the availability of germplasm of both plant and animal origin, that is adapted to extreme conditions of Rajasthan, there is need to have a systematic approach to conserve, augment, sustainably use and benefit from these resources. Much needs to be done lest we lose this valuable source of novel genes forever. Modern tools of science like genotyping and allele mining

have not been resorted to conserve this unique diversity. In general, the emerging techniques and technologies such as nanotechnology, biotechnology, remote sensing, GIS etc. have not been used effectively.

The challenge also is to provide proper institutional mechanisms and undertake organizational and management (O&M) reforms for overcoming the felt constraints coming in way of the farm prosperity in the State.

4. VISION, GOAL AND OBJECTIVES

The future vision of Agricultural Policy of Rajasthan shall be to ensure food and nutritional security and economic empowerment to the people through accelerated yet sustainable growth in agriculture. **The goal** will be to ensure food and nutrition security, farm prosperity and strengthen agrarian economy by tapping vast agricultural resources of the State through an inclusive development strategy. For this, the agriculture policy shall strive for doubling the production of food grains in the next 10 years i.e. by 2020, and to attain a minimum of 4 percent of agricultural growth per annum.

The policy unravels options and opportunities for addressing major issues in agricultural development from both short-term and long-term perspectives. The objectives under the policy shall be:

- Food and nutritional security will be given high priority to ensure social justice and equity. To ensure a balanced diet for all, particularly the rural masses, the policy will promote fruit and vegetable production and their consumption in rural areas.
- Fodder security shall be attained to meet the demand of livestock population which is increasing by 4 percent annually and is expected to be around 8.68 crores by 2020. This shall be ensured by promoting fodder crops and both fodder and feed storage systems, as well as by promoting silvi-pastoral practice in the arid western Rajasthan.
- To bridge the existing yield gap through adoption and up-scaling of improved technologies involving public, private and community approaches for extension delivery and input availability.
- To promote water management practices that save water atleast by 30 percent and increase productivity per unit of water.
- To make grey areas green through adoption of new technologies, including scientific land use planning and integrated farming system's mode.
- To increase farm income by minimizing on cost of cultivation, increase in productivity, rural based agro-processing and value addition, and by linking farmers to market.

- To promote much needed diversification of agriculture, comprising an amalgam of cash and specialty crops (like seed spices, guar, moth bean etc.), horticulture, animal husbandry, dairying, bee-keeping, sericulture, agro-forestry, and inland aquaculture. In this context, area specific development of integrated agricultural production systems, associated with market linkages and post-harvest management, will be accorded priority.
- To encourage individual, joint or contract-farming for specialty crops in order to ensure higher income through efficient production, processing and export of value added commodities.
- To discourage migration, both seasonal and permanent, of rural people to urban areas through various means of improved rural livelihood and income generation through on-farm and off-farm opportunities.
- To accelerate capital formation in agriculture through long term both public and private investment including development of infrastructure such as roads, communication, silos, cold chain, and agro-based processing industries. State shall make available necessary resources to ensure full benefits from Centrally Sponsored Schemes in future.
- To complement and align different development initiatives through a well coordinated mechanism between different Ministries/ Departments as well as initiatives under the State Livestock Policy, State Water Policy and State Agro-Industrial policy. For policy directions, coordination and monitoring, a State High Level Agriculture and Rural Development Coordination Board under the Chairmanship of Chief Minister / Chief Secretary shall be created as a matter of priority.

5. STRATEGY:

- 5.1 Integrated Farming System's Approach especially for Dryland Agriculture:** Since the vast rainfed areas in the State encounter droughts and crop failures in most years, integration of crop farming with horticulture, animal husbandry, back-yard poultry, agro-forestry and pasture development is often necessary for generating farm income and sustaining livelihood of the small and marginal farmers in the State. Such a farming system not only allows most optimal use of on-farm resources but also helps in avoiding land degradation and environmental pollution, besides providing income to the farm family on regular basis, as the system will be based on the principles and practices of watershed management. The arid regions also need effective water harvesting and conservation practices along with conjunctive use of water. Therefore, the State will encourage development of various cost-effective and sustainable models of integrated farming system for greening dryland areas in the vast arid and semi-arid tracts of the State.

Arid horticulture forms an important component of the integrated farming systems in the State. Arid areas do provide special niche for the production of arid fruits like ber, pomegranate, aonla, kinnow, malta, bael, lasoda (*Cordia myxa*), ker (*Capparis decidua*), custard apple and datepalm and other under utilized fruits. The plantations and silvi-pastoral systems can also be ideally utilized for carbon trading. All plantations have to necessarily follow the water-saving practices like micro-irrigation. Protected cultivation of vegetables and flowers in arid areas can also prove profitable to the farmers and increase their income to a great extent. Farmers will be motivated to adopt integrated farming practices for increased income and better livelihood.

Mixed/inter-cropping and diversification of the crops such as arid horticulture crops, vegetables, sericulture, medicinal and aromatic plants, agro-forestry, seed spices and fodder crops shall be encouraged in the western part of Rajasthan.

Organic farming can add yet another dimension to income generation from horticultural crops in the arid Western Rajasthan. This, however, shall be facilitated by educating the farmers about exclusive organic cultivation practices along with certification and marketing of organic produce and products. Post-harvest management, agro-processing and value addition of fruits and vegetables will lead to holistic development of horticulture and higher income generation, thus helping the resource-poor farmers.

5.2 Optimum use of resources: Reclamation of degraded soils, soil conservation, soil testing, soil fertility mapping, crop residue management, promotion of organic farming and optimal land use need to be promoted. Modern tools of remote sensing and GIS will be deployed for land use planning and sound management options for profitable use of the vast land resource available in the State.

Rajasthan has no other recourse but to take the path of more crop and income per drop of water. Micro irrigation is the only option and hence shall be popularized along with water budgeting in command/canal areas with reduced conveyance losses. Rain water harvesting by construction of farm bunds, dugout farm ponds, 'nadies', polythene lined water ponds etc. will also be the major thrust area. Private and community initiatives will also be encouraged in water sector. A multi-priority analysis and deciding priority and developing guidelines for the public use of water shall be adopted. Regulatory aspects will be reviewed and existing mechanisms shall be amalgamated desirably into a single State Water Law.

Use of brackish and saline water for the plantation crops such as date-palm and other trees and crops that are tolerant to salinity shall be encouraged. Similarly, treated waste water shall be used for irrigation

purpose particularly for non food crops such as cotton, fodders like berseem, lucerne etc.

- 5.3 **Enhanced availability of quality Seed:** Production of breeder, foundation and certified seed and their availability need to be enhanced with special emphasis on new high yielding varieties/hybrids that require less water and are short duration in nature. Seed Replacement Rate (SRR) will have to be increased particularly in case of pulses and oilseeds. Seed village concept will be encouraged. Incentives to and partnership with the private seed sector will be ensured to enhance timely availability of quality seeds especially of hybrids in the State. A rolling plan for each 5 year cycle will be prepared and monitored for implementing. Availability of fish seed and semen of proven bulls will also be enhanced.
- 5.4 **Nutrient Management:** Integrated nutrient management practices will be promoted, especially to address micro nutrient deficiencies. Application of bio-fertilizers will be promoted concurrently to ensure a target of 10 percent to begin with. Vermi-composting and recycling of farm residues will be popularized. To improve efficiency of fertilizer use, enhanced location-specific research on efficient fertilizer practices (such as balanced use of nutrients, correct timing and placement of fertilizers, and wherever necessary, use of micronutrient, bio-fertilizers, and soil amendments) will be promoted. Policies for fertilizer mix for specific crops, especially vegetables and for use of liquid fertilizers will be put in place. Soil health cards for every farmer shall be provided.
- 5.5 **Integrated Pest Management:** Chemicals do cause environmental hazards and pollution of both soil and the produce. Hence, integrated pest management (IPM) practices and use of bio-agents/ bio pesticides will be promoted to control the pest and diseases involving farmers' participatory approach. Residues of agro-chemicals in crop produce shall be minimized. Required Referral laboratories in the State will be established. With greater emphasis on IPM approach, use of pesticides will be reduced by half by 2020.
- 5.6 **Farm Mechanization:** Seed-cum-fertilizer drill, zero till drill, lazer levelers and various farm implements and tools need to be popularized along with bullock drawn implements for small and marginal farmers. Seed dressers, sprayers, weeding implements, and other drudgery reduction implements will be popularized. Custom hiring system will be promoted and popularized using the concept of Agri-Clinics. For this, rural youth will be provided vocational training and given needed incentives.
- 5.7 **Fodder production:** Diversified livestock production in Rajasthan is an integral part of farming system. There is specific need for the assessment of fodder demand and supply, especially in drought years. Scientific methods of fodder preservation and storage and fodder banks in rural

areas will be the right step in this direction. There is a need to complement the efforts for green fodder production as per State Livestock Policy e.g. fodder production, availability of fodder seeds, making of silage, promoting silvi-pastures, and extension efforts to motivate farmers to grow fodder crops.

5.8 To ensure the quality of inputs like fertilizer, Insecticides and seeds:

Private intervention in agricultural services will be promoted. Unemployed agriculture school pass outs and graduates would be trained and attracted towards custom hire services and input delivery systems by providing necessary incentives/financial support to start Agro service centers/Agri-clinics etc. Quality control mechanism will be strengthened, effectively administered and monitored. Measures to punish guilty will be strictly implemented.

5.9 Infrastructure facilities: Needed infrastructure facilities particularly those pertaining to marketing, cool chain, storage (including modern silos), rural based agro-processing and facilities for exports will be created through Government and Private Sector initiatives.

5.10 Support for Agricultural Research and Education: Adequate support to State Agricultural Universities (SAUs) will be provided by doubling their resource allocations significantly in order to have adequate and competent faculty, a pre-requisite to build trained man power, generate need based technologies and their up-scaling. Precision farming, organic farming, use of biotechnology for required breakthrough/genetic improvement against biotic and abiotic stresses etc. will be given high priority for future research. Major research thrust will be on crops that are unique to the State. Job oriented UG/PG programmes, Diploma and capacity building certificate courses through vocational training will be given priority in this Agriculture Policy.

5.11 Alternate energy sources: Utilization of renewable energy (mainly solar and wind) in agriculture and promotion of energy plantation on waste land, using appropriate, cost effective and efficient technologies will be a priority area under this policy. Through an integrated approach, sufficient power generation will be targeted and achieved as a matter of priority.

5.12 Extension Support and Capacity Development: Revitalization of existing extension system will be given a high priority under this policy. Private sector will be encouraged for extension services in order to complement the work of public extension system. Media and other communication means like ICT, mobile phones etc. will be used extensively to promote good agriculture practices. A dedicated channel on agriculture will also be launched through public-private partnership so as to ensure better access to knowledge for farmers in Rajasthan. Kiosks will be opened at village Panchayat level for knowledge empowerment of the

farm families. Also focus will be on documentation of Indigenous Traditional Knowledge (ITK) being so rich in Rajasthan.

5.13 Improving the Livelihoods of Farmers: Crop-livestock integrated farming systems and creating better livelihood options through agro processing and value addition will be promoted. Conversion of landless labour and resource poor farmers into skilled workers through imparting skill oriented training with strong follow-up support will be a key for off farm employment generation. Incentives will be provided through micro-financing/lower interest rates (4 percent) to support small farm holders for better livelihood. Also emphasis will be on rural non-farm enterprises for retaining youth in agriculture.

5.14 Credit Support: Credit at lower interest rates (around 3-4 percent) will be ensured to all smallholder farmers in the State.

5.15 Gender Mainstreaming: Women empowerment in agriculture will be a major thrust of this policy. Special programmes for women empowerment in agriculture sector, especially targeting maternal and child health care, to overcome their drudgery and to provide them proper education/training/skills associated with required incentives will be launched. Appropriate policies will also be put in place to ensure their effective role in decision making.

5.16 Capital formation and investment in agriculture for needed diversification: The strategy of this policy emphasizes major efforts towards diversification of agriculture. But diversification is not to be viewed parochially only in terms of crops alone but would encompass composite agriculture having crops, horticulture, livestock, fisheries and secondary agriculture related to these. Farmers and rural people would be motivated and enabled to adopt all related means and practices for increased income and better livelihood. Towards meeting this objective, there is a need to not only augment but also re-structure the pattern of investment in agriculture. Steps would be taken to improve capital formation in agriculture through both Public and Private Sectors. Switching from traditional crop cultivation to horticulture, for example, would require more investments on cold chain including cold storage, warehouses, processing units, and marketing network, along with general facilities such as rural roads, provision of electricity, communication, etc. Simultaneously, efforts will be needed to revitalize agriculture through use of new cutting edge technologies such bio-technology, precision agriculture, nanotechnology etc. and out scaling of innovations. This would require substantial increase in investment on research for development in agriculture. To ensure speedy growth, capital investment in agriculture will be doubled in next five years.

5.17 Organizational and Management Reforms

Change is difficult but change we must. Organizational and management reforms are difficult to decide and implement but those do bring about great impact. For example, market reforms are greatly needed but very little is being done and implemented. Farmers need to be linked to markets. They need to have a role in deciding the price of a commodity and be enabled to do so through cooperative, Self help Groups (SHGs) and civil societies. The decision making process in the Government has to be devolved. Several powers could be delegated to lower rungs of the government structure. The PME (priority setting, monitoring and evaluation) cells will have to be established and wherever already established may be revisited and strengthened for better performance. The outcome and impact assessment, also, need to be carried out.

Starting of new initiatives may be based on felt need and may involve the stakeholders, mostly the farmers. It should be meticulously done through proper methodology and appraisals rather than on individual perceptions.

In case of extension, Agricultural Technology Management Agency (ATMA) and Krishi Vigyan Kendras (KVKs) would henceforth work in unison. There should be a special cadre-well trained for extension purpose. Private extension also needs encouragement. There is a need to avoid duplication or overlap of institutional mandate and structures. The lack of complementarity and united client focus will be addressed.

Increased use of Information and Communication Technologies (ICTs) is needed in all endeavours including governance. Little institutional reform has occurred in public sector agriculture research or extension that allows it to cater effectively to changing demands for agricultural innovations. Structures and mechanisms such as Rajasthan Council for Agricultural Research and Education (R-CARE), Pulse Development Board, Centre for Abiotic Stress Management and Climate Change, Seed Cooperatives through a specific Act, Nursery Act, related subordinate legislations etc. need to be considered as appropriate and as needed. A coordinating mechanism is needed to have complementarities between different components of agriculture and related sectors.

6 ROAD MAP FOR IMPLEMENTATION:

6.1 Food and Nutrition Security to be addressed through:

- Accelerated growth in the production of foodgrains, vegetables and fruits to meet increasing demand. The increase should be more in case of coarse grains to meet the energy requirements of those below poverty line (BPL) at affordable rates.
- Increasing production of horticultural products, animal products and other components of food, in line with specific needs and demand.

- Enhancing productivity of all food commodities to keep the cost of production at reasonable level. This would warrant upgrading technologies and increasing investment in agriculture. Research should emphasize more on producing nutritionally rich varieties of food commodities.
- Increasing the purchasing power of the masses, particularly of the poor and weaker sections of the society.
- Improving post harvest management and marketing of food items

6.2 Management of Land Resources

- A high level policy-cum-coordination committee will be constituted to look into the issues of Land reforms and scientific land use planning, water and other inputs, including credit. Representatives of the Agriculture University, animal husbandry, agriculture, water resources, power and revenue departments will be the members of this committee under the chairmanship of Minister of Agriculture.
- Land use should be delineated on the basis of arid, semi arid and assured irrigated areas. Land must be allocated for different uses based upon land capability, land productivity and production goals. GIS and Land Use Planning will be given high priority so that needed reorientation is ensured for some of the non-scientific cropping systems, especially in the arid lands of the State, including Indira Gandhi Canal command areas.
- Cropping pattern and mixed farming will be planned on the basis of suitability of land for growing food crops, cereals, high value crops, fruits, aromatic and medicinal plants, etc. Rotational grazing by animal / livestock and stall feeding will be promoted to prevent degradation of grasslands.
- District and village Panchayat level soil health maps (including salinity/alkalinity, micro-nutrients etc.) will be prepared for integrated farming system development and higher productivity/sustainability. Extensive efforts will be made to improve the soil health. Deficient zones in the micro nutrients such as zinc, sulphur, iron etc. will be demarcated for correcting the nutrient imbalance. Use of gypsum for both reclamation and as basic nutrient for oilseeds and pulses will be given high priority. For this, 1.00 lakh MT gypsum per year will be targeted for distribution among farmers at subsidized rates. More than 10.0 lakh soil samples will be tested every year and farmers will be advised to use fertilizers as per their soil test recommendations.
- Organic farming, with special emphasis on horticultural crops will be promoted. Main emphasis will be given on cultivation of organic seed

spices and medicinal crops for export promotion. Contract farming will also be promoted for improving income and market access of the farmers in the region.

6. 3. Water Management Including Dryland Agriculture

- The policy will strive for efficient management of all sources of water i.e. surface water, groundwater and rain water. It will promote water saving devices like drips, sprinkler, in-situ rain water conservation and other farm practices for efficient and optimal utilization of each drop of water.
- The Agriculture Policy will consider and harmonise the recommendations as given in the **Rajasthan State Water Policy prepared by the State Water Resources Planning Department (2010)** which addresses issues related to integrated water resource management, water resources infrastructure, water conservation, water quality, micro-irrigation, capacity building and research relevant for use in irrigated agriculture with focus on efficient use of water and optimum utilization of surface, ground and rainwater.
- Special attention will be given on harnessing the rain water. Present level of rain water use is 33 percent. Time bound programme will be prepared for increasing the use of rain water. Emphasis will be given on promotion of water harvesting structure and suitable water conveyance system. Construction of water reservoirs or '*diggies*' in canal command areas will be supported with installation of sprinklers and drips. Construction of large number of diggies and farm ponds (*'khet-talai'*) will be targeted to be constructed in a time-bound manner. Fisheries, wherever feasible, will be promoted in these water harvesting and storage structures by providing technical know-how and fish seed. To complement the State Water Policy, efforts will be made to promote micro-irrigation such as drip and sprinkler. It is proposed to cover around 5 millions wells and the canal command areas under drip / sprinkler irrigation system. Piped water conveyance will be promoted to reduce the water conveyance losses. Awareness building and education of farmers for water saving and efficient use of water, including conjunctive use of surface and ground water will be promoted.
- Dryland agriculture, in particular, will be addressed through proper crop planning/crop substitution for aberrant weather conditions; efficient cropping and farming systems; use of efficient farm implements and promotion of alternate land use systems *viz.*, agro-forestry, pasture development, silvi-pastoral systems, agri-horticulture will be undertaken in association with the institutions/agencies concerned.
- All agriculture development in rainfed areas will be planned and implemented on a watershed basis only. All plans will be prepared on

individual agro climatic zone basis. Drought management, including contingent cropping strategy and the seed bank will be given due emphasis for rainfed agriculture.

- Special attention will be focused on water quality and receding ground water levels in certain areas due to over exploitation/ withdrawal. Participatory community irrigation management will be popularized and encouraged through Water User Associations (WUAs) and their empowerment.
- A legislation to prohibit ground water exploitation for any purpose without prior Government approval will be brought about for the areas having reached to the critical water level.
- Incentives will be provided to popularize good agriculture practices such as micro irrigation, water-shed management, conservation agriculture, use of certified seeds etc. and disincentives will be put in place to discourage undesirable practices such as growing of water intensive crops, irrigation through flooding, etc. Subsidy on sprinkler, drip system and electric motor/diesel pump sets will be ensured to farmers directly to an extent of 75 percent.
- Water quality maps for irrigation water will be prepared and recommendations for their efficient use will be provided.

6.4. Enhanced Availability of Quality Seed and Planting Material:

Production of quality seeds of high yielding/improved varieties and hybrids, which are disease resistant and of short duration, will be taken on priority.

- Seed production and supply of planting material in the State by the private sector will be promoted.
- Incentives to plant breeders will be provided for evolving varieties/hybrids of cereals, oilseed, pulses and other major crops suitable for the requirement of different agro climatic zones in the State.
- More emphasis will be given to achieve the Seed Replacement Rate (SRR) to the optimum level. The average SRR of '*kharif*' crops which is presently 27 percent and that of '*rabi*' crops is 33 percent, efforts will be made to double SRR i.e. around 50 percent in '*kharif*' and 70 percent in '*rabi*' crops by next 10 years. The targeted SRR for hybrids of all crops has to be around 100 percent.
- Farmers' participatory seed production will be promoted. Seed cooperatives of the farmers will be encouraged.
- Hybrid seed production of Bajra, Maize, and Cotton in the State will be encouraged and research support would be provided for the development of the varieties and seeds of State specific crops.

- Fish seed will be made available to farmers in sufficient quantity and incentives will be provided for fish farming.
- For genetically superior bucks, rams, bulls and he-buffaloes, specialized farms will be established through involvement of private organizations.

6.5. Support for Insurance

- To protect farmers against crop and livestock losses, due to failure of monsoon or other natural calamities, National Agricultural Insurance Scheme (NAIS) and/or weather based insurance would be promoted throughout the State for all crops and especially for all milch animals and other livestock. Strategy to provide compensation for losses against natural calamities will be devised using village as a minimum unit rather than a block.

6.6. Integrated Nutrient Management

- Availability of nutrients for increased crop production will be ensured on the basis of Soil health cards/ Soil health village cards. It is proposed to cover all 58.20 lakh land holdings and provide Soil Health Cards to all farmers by 2015.
- The cultivators will be motivated to use organic/bio-fertilizers for improving the soil health. For this, the State will take up a massive drive for organic recycling and use of bio-fertilizers. The services of private sector and new entrepreneurs will be ensured for this purpose and needed incentives will be provided.
- Farmers will be motivated to use crop residues / organic material, green manuring, crop rotations involving legumes, etc. to improve the physical and nutrients status of the soil.
- All out efforts will be directed towards improving fertilizer use efficiency.

6.7 Promoting Organic farming

- A list of crops, herbs and horticulture crops livestock that can be sourced from rainfed regions in view of the international trade in organic food and allied products will be prepared and strategy devised to promote their organic farming.
- Efforts will be made to create awareness and capacity building of farmers regarding cultivation, harvesting, grading and standardization, certification and marketing of organic produce, including their value addition.
- Develop appropriate policy instruments for the rain fed farmers engaged in organic farming such as: subsidized inputs, market information, certification of organic produce etc.

6.8. Integrated Pest Management and Good Agricultural Practices

- Integrated Pest Management Centers will be created in every Zone for the study of behaviour and emergence of pests, diseases and weeds.
- The management of pests, diseases and weeds will be ensured through subsidized agro-chemicals, especially biological agents. The State policy will encourage needed incentives for organizing season-wise field schools on pest management of different crops and for organizing training camps at Panchayat level to train farmers for the use of bio-agents / bio-pesticides.
- Residues in soil and agricultural products shall be minimized. A pesticide residue testing laboratory shall be created particularly for crops, fruits and vegetables. Agro-chemicals particularly pesticides will be recommended strictly as per registration by the GOI and as per the related label claim. Advisories will be issued to the farmers for good agricultural practices. Only those chemicals which have short duration effect on environment, and which have no residual effect on final produce, shall be promoted.

6.9. Farm Mechanization

- Cultivators will be motivated and given incentives to use improved farm tools and machines for timely operations particularly for small and marginal farmers and to reduce labour cost as well as drudgery, especially for farm women.
- A Production-cum-Testing Centre of improved tools/machines will be established in the State.
- Zero tillage machines, reapers, seed-cum-fertilizer drill, laser levellers, bailing machines other farm implements would be popularized as a matter of priority.
- For manpower training and capacity building in the field of farm mechanization, needed workshops/institutions will be established / promoted.

6.10. Diversification

- Overall diversification in agriculture would be promoted to ensure integrated farming system around crops, horticulture (including vegetables), livestock, backyard poultry, fisheries and also secondary agriculture related activities.
- Greater emphasis will be laid to popularize mixed farming/inter cropping, especially in the rainfed areas.

- Diversification of crops from more to less water requiring crops, especially low volume high value crops will be encouraged. Farmers will be motivated to grow horticultural crops, medicinal & aromatic plants, seed spices, fodder crops, agro-forestry and livestock rearing. Since the State has comparative advantage for arid horticulture for which cultivation of *Ber (Gola, Seb, Mundia)*; pomegranate (*Jalore Seedless*), *Bael, Aonla, datepalm, Gonda, Ker, Karonda* etc. will be promoted. Sericulture, bee keeping, mushroom production will also be encouraged.
- In order to economically empower the farmers, vegetable cultivation will be promoted in a big way which would also lead to generation of additional employment. To insulate farmers from the price fluctuations, cold storage and cool chain will be promoted. In addition, processing and value addition and linking farmers with markets will receive high priority.
- Desert is having peculiar fauna and flora. Medicinal plants found in this harsh climate need to be exploited for their medicinal value. Efforts will be made to characterize these specific plants for their commercial use as well as for conservation. The efforts will be aligned to the directives and provisions of the Biological Diversity Act (2002) of the GOI as also with the activities of the State Biodiversity Board, which shall be made fully functional soon.

6.11 Extension Services

Special efforts will be made to revitalize the extension system in the public sector i.e. the Department of Agriculture and Horticulture. There is also a need to have convergence of KVKs and ATMA so as to ensure holistic delivery of technical knowledge, skill and expertise. Vocational training to the farmers, farm women and the rural youth, practicing agriculture will be given a high priority for enhanced livelihood and better income. Special focus will be on finding technological solutions to the field problems through farmers' participatory mode.

The pre-seasonal Kharif and Rabi training camps, popularly known as Krishi Gyan Avam Aadan Shivir and Krishi Abhiyan, respectively will be institutionalized in which besides Agriculture, horticulture, Animal Husbandry, Credit Institutions, University Scientists / KVKs will be actively involved in dissemination of technology/in hand solution to the farmers problems besides providing inputs like seeds and fertilizers at gram panchayat level. Establishment of the Kiosk at Panchayat level will be a major activity.

Private sector will be encouraged to complement/supplement and work in partnership with public extension system. Media and communication system, including the use of cell phones shall be promoted under new extension regime. Additionally the input dealers will be

provided new knowledge about the technologies for further dissemination to the farming community. For this, networking of all the sub-district level offices with the State head quarter will be ensured to serve the 3 million farmers from all over the State and all the technical messages, advisories and market information will be disseminated on regular basis. Overall, the entire extension system will be revamped and energised.

Establishment of farmers' schools and Rural Technology Centers at Panchayat level, Agri-clinics and agri-business enterprise by the agriculture graduates will be the major focus. For enhancing small farm productivity and farm income, location specific appropriate technologies and innovations would be up-scaled and extended to farmers. Knowledge empowerment of the farmers will be aimed through the use of ICT, mobile phone, and also through a dedicated TV channel on agriculture, which should exclusively cover agriculture and allied areas, including agro-processing, agri-business and rural development.

6.12. Infrastructure Facilities and capital formation

- Capital formation in agriculture will be encouraged both by public and private sector. Adequate facilities will be created for developing markets exclusively for farmers, have roads, cold chain, warehousing etc. towards safe storage of agriculture produce. The State will undertake installation of green houses on large scale for vegetable production. Credit availability will be ensured on the goods pledged under pledge loan scheme. Private sector will be encouraged to set up Agro-processing units in the State for which incentives and single window delivery will be ensured. While investments by the public sector will be increased, private sector will also be encouraged to create assets for capital formation in agriculture and rural sector.
- Institutes for manpower training and R & D purposes will be established in western and south western Rajasthan and other areas as necessary to capitalize on comparative advantage of the region for agro-processing and post-harvest management of agri-produce.
- State Agricultural Universities (SAUs), unlike traditional universities, have teaching, research and extension functions and are chiefly responsible for the development of new technologies, their assessment, refinement and dissemination. Hence, SAUs should be fully supported financially for recruitment of the full faculty including regional stations, for the State of the art infrastructure by the State Government and provided required autonomy. Some portion of Rural Development Fund, *Mandi* Cess or similar sources would be specifically earmarked to support agriculture universities, as being done in the States of Punjab and Madhya Pradesh.

- In villages, cooperative institutions will be strengthened / established for marketing and value addition of agriculture produce so as to generate more income to the small holder farmers.
- Availability of electricity to the farmers for at least 12 hours a day will be ensured. All efforts will be made to ensure that during the peak periods, the farmers get uninterrupted supply of electricity. Wherever '*diggies*' / farm ponds are promoted by the GoR on subsidy, the electricity connections to '*diggies*' will be provided expeditiously and on priority.
- The State enjoys a major share and export advantage in guar and several spices crops like coriander, fenugreek and cumin etc. Associations in export business will be promoted for value addition and export of agricultural produce.
- A communication network for all major '*mandies*' will be established to provide useful market information to the farmer's vis-à-vis exportable surplus, international marketing centers, possible links etc.
- State crop credit refinance facilities will be established to ensure easy access of credit to farmers at lower interest rates of 3-4 percent.

6.13. Strengthening Research

Considering importance of agricultural research for inclusive growth and development, the State will accord highest priority and double its resource allocation to State Agriculture Universities in the next five years.

State-specific agricultural research system will be revisited and re-oriented to achieve desired goals for sustainable agriculture. Currently, the agricultural research system is mainly dependent and directed by the All India Coordinated Programs of ICAR and other externally funded schemes. Hence, adequate financial support will be provided to the State Agriculture Universities for meeting their requirements for research, teaching and extension activities rather than completely relying on outside agencies. Up-scaling of technologies will be ensured for large scale adoption in crops, livestock, horticulture, fisheries, agro-forestry and agro-processing sectors of agriculture, and women empowerment.

Agricultural research on developing disease free, short duration and stress tolerant varieties will be emphasized. Research on water and fertilizer use efficiency, non conventional minor fruits and vegetable crops will be promoted. Development of hybrids especially in vegetable crops, pigeon pea and mustard will be strengthened. Validation of farmer-led innovations and Indigenous Technical Knowledge (ITK) will be high priority at SAUs, KVKs and ATCs.

Global climate change is indeed a burning issue. Research support would be provided to take care of issues related to adaptation and climate change mitigation. A centre on climate change and abiotic stress management shall also be established.

Support for value addition and agro processing will be specifically targeted. The State Government supported centres on post-harvest management, processing and value addition will be created. In view of the tremendous role of biotechnology in productivity enhancement under biotic and abiotic stress, biotechnology research in the State shall be strengthened.

In view of globalization in agriculture, both efficiency and resilience in agriculture will be the main goals of R & D in the State.

For efficient up-scaling and technology dissemination, public-private partnership (PPP) will be encouraged and required enabling environment will be provided as matter of priority. PPP mode would be encouraged in this direction wherever feasible & suitable in development of seed sector, water management and delivery of extension services.

6.14. Disaster Management

- The frequency and intensity of disasters such as droughts, floods, frost, etc. have increased in the recent years. Effective and reliable information and communication systems, needed climate services, contingency planning and resources will be put in place and further strengthened.
- Using the remote sensing and GIS technologies, weather-based agro-advisories shall be given to the farmers on daily basis through internet/web-site and dedicated TV channel.
- Seed banks for drought tolerant and short duration crops will be established as a major of contingency planning.
- Fodder banks will be established based on animal population and frequency of famines experienced in the State.

6.15. MARKETING

- Department of Agriculture Marketing will be responsible to provide all marketing facilities to the farmers to get best returns for their agriculture produces. The Central Model Act for marketing will also be adopted by the State.
- Information on competitive market prices will be made available to the farmers. Presently minimum support price (MSP) is not provided for several crops that are specific to the State. Government of India will be

requested to declare MSPs for State specific crops like moth, guar, coriander, cumin, etc.

- A Bureau of Standards will be established at the State level to ensure easy accessibility of certification agency. Conducive environment will be created for the establishment of grading and standardization facilities in the agricultural produce markets with private sector participation.
- Strengthening and expansion of warehouses and cold chain management systems will be ensured.
- Formation of farmers / producers SHGs / CIGs for marketing of agriculture produce on line of MAHAGRAPES or MAHAMANGO in Maharashtra will be emphasized.
- Cooperative marketing system through GSS, KVSS, Rajfed etc. will be strengthened.
- Institutional mechanisms will be provided and facilities for export promotion will be created particularly for minimizing the export rejections of agricultural produce and products and adhering to SPS regulations and standards by linking the efforts of Agricultural and Processed Food Products Export Development Authority (APEDA), groups and federations of industry, State Government and related R&D organizations.
- Strategic alliance with major super markets and mega markets will be struck to develop and cater to the needs of super markets for marketing of fresh produces. Use of unemployed rural man power as also agriculture graduates will be ensured in these endeavours.
- State Horticulture Cooperative Marketing Federation will be established to promote the export of horticultural products vis-à-vis fruits, medicinal plants, spices, flowers etc.

6.16. Credit Support: Availability of easy credit at 4 percent interest rate for agriculture and allied sector will be ensured through Rural Banks, Cooperative Banks and village level Cooperative Societies as per the need of the farmers. Also the share of agriculture advances to the total advances by the Commercial Banks is to be made on par with the Cooperative Banks. Further, the share of investment credit is less as compared to short term loan, which needs to be enhanced. Credit support to the needy farmers to meet essential agriculture related requirements will be ensured. Credit availability will also be ensured on the goods pledged under pledge loan scheme. Special monitoring will be done, concerning the efforts put in by the Banks to extend credit support to small/marginal/ landless farmers.

6.17. Women Empowerment: Development and promotion of women friendly drudgery reducing implements, trainings for skill upgradation, formation of SHGs of women, improved skills, credit linkages and their mobilization for economic empowerment will be targeted. Besides, incentives to women for undertaking education in agriculture discipline will be encouraged and promoted in a time bound manner.

6.18. Sources of funding

A target of allocation of funds to a level of 15 percent of agricultural GDP for implementing this policy shall be aimed and provided henceforth. The main sources of funding will be the State Government through its Department of Agriculture, Central Sector Schemes like those of DAC, GoI, ICAR and others. A portion of funds from Rural Development Schemes and Cess on 'Mandi' sales (atleast 1 percent) shall also be made available for strategic action plans proposed and particularly for strengthening Agricultural Universities (AUs) through creation of a separate budget line. The Government will specifically launch some special mega-projects to implement this policy. The Government will also approach external funding agencies like the World Bank, Asian Development Bank, Global Environment Facility (GEF) etc. for projects related to agricultural development. For other location specific projects of relatively small magnitude, the Government may allocate the State and Central funds, along with those received from NABARD, DST, DBT etc. and may also dovetail the developmental activities with other related schemes such as MNREGA, NHM, RKVY, NFSM, BRGF etc. Incentives and enabling environment will also be provided to the Private Sector for increasing their long term investment through capital formation in agriculture.

7. THE FUTURE TRUST OF THE GOVERNMENT:

The trusts of this policy will be to serve as a vehicle to:

- ◆ Align all related components of agricultural growth and will receive the fullest support of all concerned,
- ◆ Lead to increased farming systems' productivity yet maintaining agricultural sustainability,
- ◆ Promote secondary agriculture including on-farm and off-farm opportunities through value chain and entrepreneurship development, thus creating gainful employment in rural and semi-urban areas,
- ◆ Make state agriculture globally competitive,
- ◆ Ensure conservation of natural resources and provide both healthy and safe environment, and
- ◆ Bring an overall farm prosperity in Rajasthan State.
