2021 Edition

Rajasthan Agriculture

Overview

Book by RajRAS

Index

Agriculture: Overview

Rajasthan, with its diverse agro-climatic conditions, is richly endowed in the cultivation of a variety of crops and a strong animal husbandry sector. Allied sectors of agriculture, primarily refers to activities including:

- Horticulture
- Animal Husbandry & Livestock,
- Fisheries,
- Forestry.

Agriculture in Constitution

The Seventh Schedule of Constitution categories various subjects related to Agriculture as:

State List:

- 14. Agriculture, including agricultural education and research, protection against pests and prevention of plant diseases.
- 15. Preservation, protection and improvement of stock and prevention of animal diseases; veterinary training and practice.
- 21. Fisheries.
- 46. Taxes on agricultural income.

DPSP:

The directive principles of State Policy mentions:

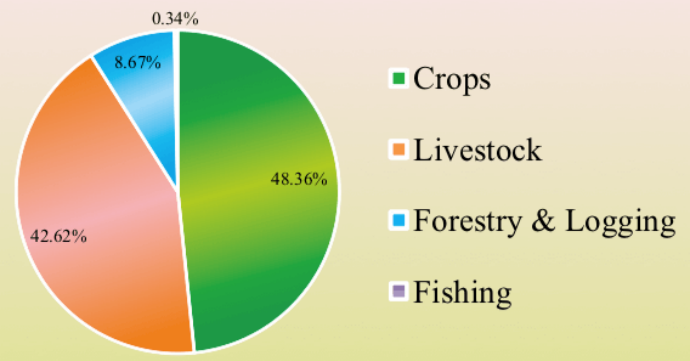
Article 48: Organisation of agriculture and animal husbandry: The State shall endeavour to organise agriculture and animal husbandry on modern and scientific lines and shall, in particular, take steps for preserving and improving the breeds, and prohibiting the slaughter, of cows and calves and other milch and draught cattle

Contribution to State GDP

Agriculture in Rajasthan continues to be the backbone of the State's economy with Agriculture & allied sectors contributing **29.77% of State's total GSDP** in 2020-21 (GSVA at current prices).

Contribution within Agricultural Sector:

- Crops – 48.36%
- Livestock - 42.62%
- Forestry & Logging - 8.67%
- Fishing – 0.34%



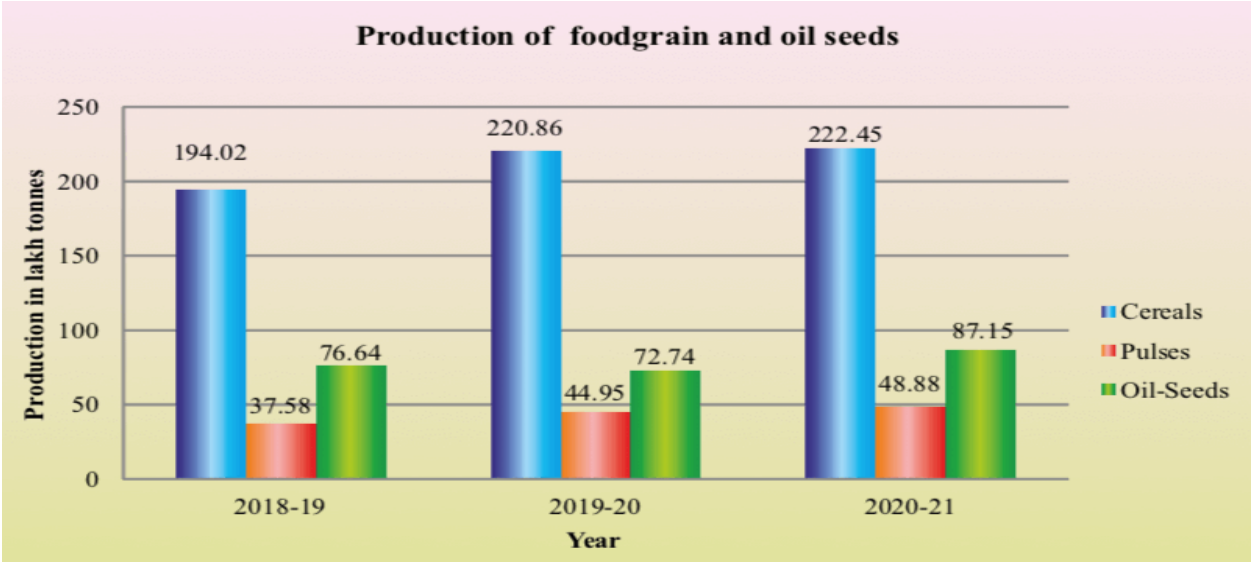
Highlights of Agriculture & Allied Sector in Rajasthan

- Rajasthan has 11.26% of the country's livestock population and contributes about 12.93% of the total milk production and 32.89% wool produced in the country.
- Animal Husbandry Sector contributes 8.74% to GSDP attributing more than 1/3rd share in Agri sector GSDP.
- Rajasthan is one of the largest states in India taking part in organic farming, with over 81,000 hectares of registered organic farm area.

Position of Rajasthan in India	Products
First:	Mustard, Guar, carom-seeds, Coriander, Fenugreek, Henna, Isabgol, Wool
Second:	Gram, Cumin seeds, Vegetables, Milk
Third:	Soybean, Pulses, Oilseeds
Fourth:	Garlic

Agriculture Production:

- Snapshot of production of food-grain and oil-seeds in Rajasthan:
  - Food grain: 271.33 lakh tonnes, of which
    - Cereals: 222.45 lakh tonnes
    - Pulses: 48.88 lakh tonnes
  - Oil-Seeds 87.15 lakh tonnes



- As per preliminary forecast for the year 2020-21, the total food grain production in the State is expected to be 271.33 lakh tonnes, which is a increase of 2.08 per cent as compared to production of 265.81 lakh tonnes for the previous year.
- The **kharif food grain** production in the year 2020-21 is expected to be at the level of 110.42 lakh tonnes (24.05 % annual increase) and Production of **Rabi food grain** production is expected to be 160.91 lakh tonnes (8.99% annual decrease).
- Production of **kharif Cereals** is estimated to be 90.41 lakh tonnes (26.89% annual increase) during the year 2020-21 and Production of **Rabi Cereals** in the year 2020-21 is expected to be 132.04 lakh tonnes (11.74% annual decrease).
- Production of **kharif Pulses** is estimated to be 20.01 lakh tonnes during the year 2020-21, showing a increase of 12.61 per cent.
- Oilseeds including Groundnut, Sesamum, Soyabean and Castor seed are grown in kharif season and Rape & Mustard, Taramira and Linseed in rabi season. The total production of oilseeds

during the year 2020-21 is estimated at 87.15 lakh tonnes (19.81% annual decrease). Also, there is more oilseed production in Rabi then Kharif season.

- Production of Sugarcane is likely to be 2.84 lakh tonnes in the year 2020-21, showing a decrease of 12.88 per cent.
- The production of Cotton is likely to be 28.33 lakh bales during the year 2020-21, showing an increase of 1.61 per cent.

Crops produced in Kharif Season (Advanced Estimates 2019-20):

Food Crop (Cereals)	Area Under Crop	Max. Production District	Productivity Maximum
Rice	Bundi	Bundi	Bundi
Jowar	Ajmer	Ajmer	Rajsamand
Bajra	Barmer	Alwar, Barmer	Dholpur
Maize	Bhilwara	Bhilwara, Chittore	Alwar
Small Millets	Dungarpur		Jalore
Pulses	**Area Under Crop**	**Max. Production District**	**Productivity Maximum**
Tur	Banswara	Banswara	Dholpur
Moong	Nagaur	Nagaur	Sikar
Moth	Bikaner	Bikaner	Jodhpur
Urad	Bundi	Bundi	Sirohi
Chowla	Jhunjhunu > Sikar,	Jhunjhunu > Sikar	

Oil Seeds	Area Under Crop	Max. Production District	Productivity Maximum
Groundnut	Bikaner	Bikaner	Jodhpur
Caster Seed	Jalore	Jalore	Jalore
Seasumum	Pali	Pali	Bharatpur
Soyabean	Baran > Jhalawar	Baran	S.Madhopur
Cash Crops	**Area Under Crop**	**Max. Production District**	**Productivity Maximum**
Bt-Cotton	Hanumangarh > Ganganagar	Hanumangarh	
Guar	Bikaner	Bikaner	
Sugarcane (Kharif)	Ganganagar, Chittore, Bundi	Ganganagar	
Sanhemp	S.Madhopur	S.madhopur	
Chillies	S.Madhopur	S.Madhopur	

Crops Produced in Rabi Season:

Food Crop (Cereals)	Max. Area	Max. Production District	Productivity Maximum
Wheat	Ganaganagar, Hanumangarh	Ganaganagar, Hanumangarh	Baran
Barley	Ganganagar > Jaipur	Ganganagar	Ganganagar
Pulse	**Max. Area**	**Max. Production District**	**Productivity Maximum**
Gram	Churu	Ajmer	Baran

Masoor	Jhalawar	Jhalawar	
Matar	Jaipur	Jaipur	Sikar
Batla	0	0	0
Sunflower	0	0	0
Oil Seeds	**Max. Area**	**Max. Production District**	**Productivity Maximum**
Caster Seed			
Tarameera	Nagaur	Nagaur	Ajmer
Rape & Muster	Tonk, Alwar	Alwar	Dholpur
Lineseed	Pratapgarh	Pratapgarh	
Mustard			
Cash Crops	**Max. Area**	**Max. Production District**	**Productivity Maximum**
Tobaco	Jalore, Alwar	Jalore	

The data has been combined from: Agriculture Ministry, Rajasthan (in 2020-21), taking into account information shared by them for 2017-18. Now this data is subjected to vary on year-basis, as crop production changes.

Horticulture Produce:

The following data has been combined from: Agriculture Ministry, Rajasthan, Report (latest available in 2021) taking into account information shared by them for 2017-18.

Produce	Max. Area	Max. Production District	Productivity Maximum
Rose	Ajmer	Ajmer	Ganganagar
Javara	Ajmer	Ajmer	Ajmer
Ganda	Ajmer	Ajmer	Bharatpur

Fruits	Max. Area	Max. Production District	Productivity Maximum
Mango	Udaipur	Udaipur	Baran
Guava	Sawai Madhopur	Sawai Madhopur	Dausa
Lime	Bharatpur	Bharatpur	Baran
Pomegranate	Barmer	Jalore	Chittorgarh
Jamun	Ajmer	Ajmer	Banswara
Aonla	Jaipur	Jaipur	Chittorgarh
Papaya	Sirohi	Chittorgarh	Banswara
Orange	Jhalawar	Jhalawar	Baran
Mausmi	Ganganagar	Ganganagar	Jhalawar
Malta	Ganganagar	Ganganagar	Ganganagar
Kinno	Ganganagar	Ganganagar	Hanumangarh

Produce	Max. Area	Max. Production District	Productivity Maximum
Isbgol	Barmer	Barmer	
Mehandi	Pali	Pali	
Opium	Chittorgarh > Pratapgarh	Chittorgarh	
Ajwain	Chittorgarh	Chittorgarh	
Cumin (Jeera)	Jodhpur > Barmer	Jodhpur > Barmer	

Monsoon

Agriculture in Rajasthan is primarily rain-fed and the period of monsoon is short. As per information of Indian Meteorology Department, the rainfall patterns indicate that during current monsoon season, the onset of monsoon was delayed by 9 days. **The normal date of arrival of monsoon in the state was 15th June**, but it arrived on 24th June. It covered the whole state till first week of July, 2020..

The actual rainfall in the period from 1st June to 30th September, 2020 in the state was 520.79 mm, as compared to normal rainfall of 520.98 mm, which is 0.04 per cent less than the normal rainfall.

In Rajasthan, during the entire monsoon season 2020, there have been abnormal, excess or normal rains in most of the districts, where as in Alwar, Baran, Bharatpur, Bundi, Dausa, Dholpur, Ganganagar, Kota and Tonk districts, deficit rainfall has been recorded.

Rajasthan Agri-Export Promotion Policy 2019

On 17th December 2019, Rajasthan Chief Minister, Ashok Gehlot, launched the *Rajasthan Agro Processing, Agribusiness and Agri Export Promotion Policy 2019* to encourage agro-processing and agricultural exports and increase farmers' income in the state. The policy endeavours to make Rajasthan as production and supply hub of processed agricultural products and a destination of choice for investors, processors and exporters.

Objectives:

1. To promote cluster based approach in production and agro-processing.
2. To augment farm gate infrastructure
3. To promote backward-forward linkage for a sustainable system for farming and industrial sector
4. To minimizing the post harvest losses by strengthening the supply chain.
5. To accelerate capital investments in value and supply chain of agriculture and allied sector.
6. To augment the capacity of agro-processing sector to upscale the operations through capital infusion, technology transfer and hand holding support.
7. To promote market outreach of fresh fruits & Vegetables, ethnic food items, organic produce and value added agri-products of state in domestic and international market and to build a strong State brand.
8. To support the agro-industry for greater compliance and adoption of the standard of food safety and hygiene in order to meet the norms set up by FSSAI and importing countries.
9. Capacity building and skill upgradation through institutional training to ensure sustainable employment opportunities to the people and also to reduce the gap in requirement and availability of skilled manpower in the food processing sector
10. To develop state as logistic hub by creating support infrastructures near NCR and in DMIC catchment area.
11. To initiate suitable policy measures for developing a fast and vibrant agri business sector.

Scope & Coverage

- The Policy will be applicable to new agro processing and agro business enterprises set up in the State and also to existing agro-processing and agro-business enterprises undergoing modernization, expansion or diversification.

Duration

- The Policy will be operative till 31st March, 2024 and be reviewed in year 2021.

Eligible Sectors

Rajasthan Agro-processing, Agri-business and Agri-export Promotion Policy, 2019 will cover the following sectors:

- Fruits & Vegetables processing
- Spices processing
- Cereal/other consumer food products
- Oilseeds products
- Rice & flour milling
- Pulse processing
- Herbal, medicinal, flower and aromatic products
- Minor forest produce processing
- Honey processing
- Milk processing
- Meat (other than beef), Poultry, Fishery processing
- Cattle feed, poultry feed, fish meal products
- Non edible agriculture produce processing
- Other such Agricultural and horticultural product processing activities for preparing food flavours and colours, oleoresins and mushrooms products

- Agri Waste Processing Units
- Infrastructure Projects: Collection/Aggregation Centre, Warehouses, Cold Storages,
- Food Irradiation Processing Plants, Cold Chain, Pack houses, agro-processing clusters or parks declared by State Government, Reefer Vans etc.

Ineligible Sectors

Following sectors will not be eligible under Rajasthan Agro-processing, Agri-business & Agri-export Promotion Policy, 2019:

- Investment for manufacturing Tobacco products, Pan Masala containing tobacco, Gutka other intoxicated products
- Investment in stand-alone bottling or packaging plants including bottling/packaging plants for potable liquor, beer, or aerated drinks
- Beef Meat Processing units
- Manufacturing of soft drinks, production of mineral waters and other bottled/pouched waters
- Manufacturing or sizing of wood, manufacture of furniture and products made from wood and cork
- Production of firewood and charcoal
- Processing units discharging toxic effluent without having effluent treatment plant.

Salient Features of the Policy

- State Level Sanctioning and Monitoring Committee (SLSC) shall be competent to include/exclude any sector/sub-sector from the ambit of Policy to ensure all-inclusive growth of Agriculture and allied sector in the State.
- Cluster based approach to minimize the postharvest losses.
- Increase participation of farmers and their organizations.
- Raising farmers income by involving them in value addition and supply chain directly.

- Promote value addition and export of crops with production advantage like cuminseed, coriander, guar, isabgol, pulses, oilseeds, henna, kinnu, senna, pomegranate and fresh vegetables etc.
- Employment generation - Skill Development through food processing training courses.

Financial support envisaged

- Capital subsidy on for establishing agro-processing and infrastructure development 50 per cent of project cost subject to a maximum of 100 lakh to farmers & their organization and 25 per cent of project cost subject to a maximum of 50 lakh for all other eligible entrepreneurs.
- Additional top up capital investment subsidy for the projects sanctioned under Government of India (GoI) schemes 10 per cent of project cost subject to a maximum of 100 lakh to farmer & their organization and 50 lakh for all other entrepreneurs.
- Interest subsidy of 5 per cent on term loan to all eligible project for reducing operating cost.
- 1 per cent additional interest subsidy to farmers and their organizations, units in TSP or backward districts, units with 100 per cent ownership of SC/ST or women entrepreneurs and young entrepreneurs with age below 35 years.
- Maximum limit of interest subsidy during a period of 5 years shall be 100 lakh for farmers and their oganizations for infrastructural projects and 50 lakh for all other categories.
- Freight Subsidy of 10 to 15 lakh per annum for export of agricultural products of Rajasthan origin for a period three years. To support quality produce and to tap export markets, higher transport subsidy of 20 lakh per annum for a longer period of 5 years have been provisioned for organic produce.
- Freight subsidy of 15 lakh per annum for transport of fruits, vegetables and flowers in distant markets of other states beyond 300 Km for a period three years.
- Electricity tariff subsidy at the rate of 1.0 per KWH with a maximum ceiling of 2.00 lakh per annum for a period of 5 years or 30 per cent subsidy on cost of solar power plant within a ceiling of 10 lakh is allowed.
- To support quality produce and to tap export markets, higher transport subsidy of ₹20 lakh per annum for a longer period of 5 years have been provisioned for organic produce.

Credit Facilitation:

- For ensuring easy availability of funds to projects under this policy, a separate fund of 2500 crore in Rajasthan State Cooperative Bank Ltd.

Soils of Rajasthan

Soil is one of the most important natural resources as mankind is dependent on soil for food. By definition, soil is the top-most layer of earth crust. The soils of Rajasthan have developed under the arid and humid climate over the bed rocks of complex nature predominately through the process of **Laterization**.

Classification of Soils:

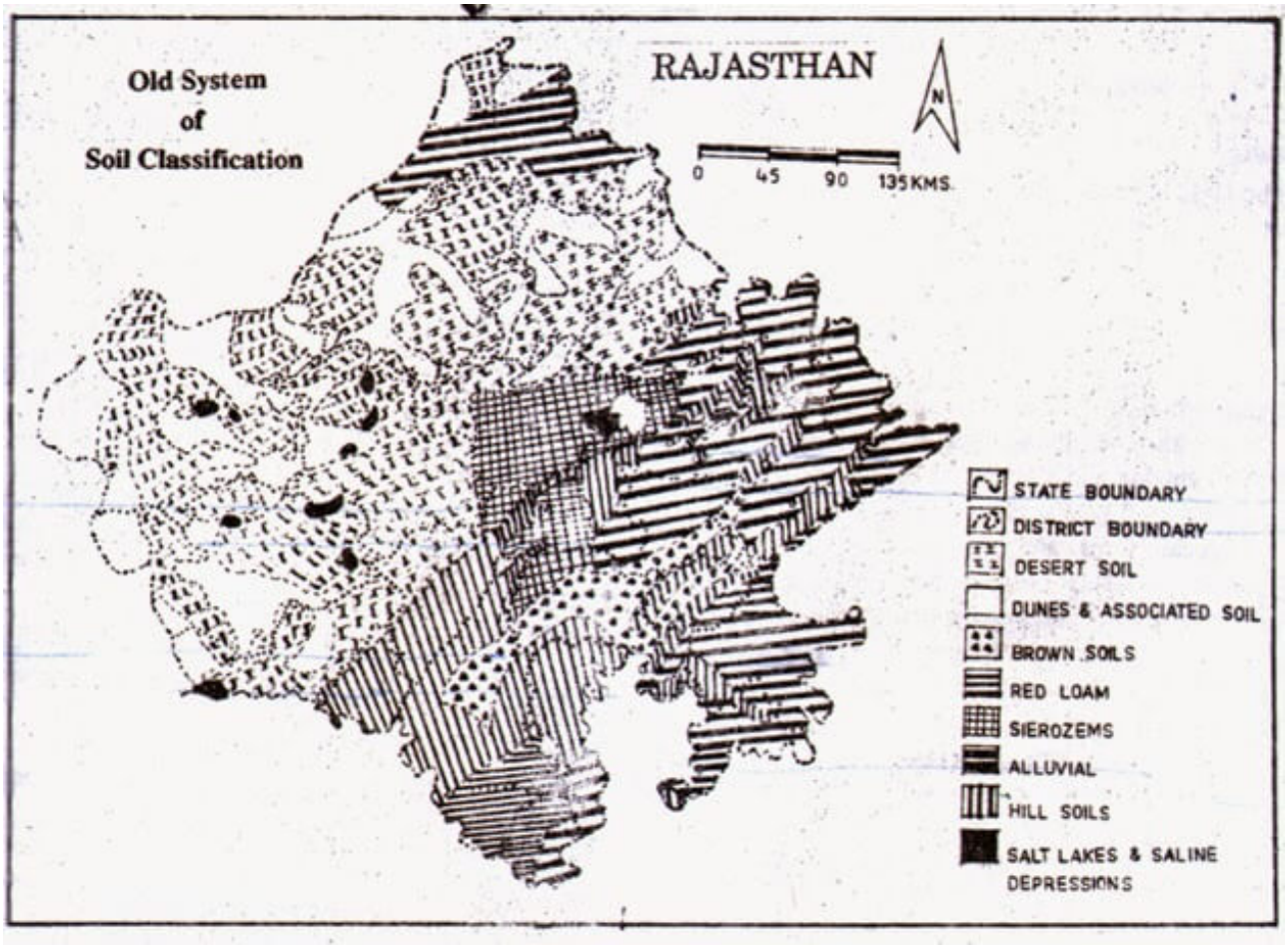
In India, two system of classification are dominant. They are:

- Old System of soil classification
- New comprehensive system of soil classification

Old System of soil Classification

The old system of classification was developed by scientists (Thorpe & Smith) of U.S department of Agriculture in 1949. The classification is based upon *differences in climate and mineralogy*. As per this system, soils of Rajasthan can classified into 8 types:

1. Desert Soils
2. Dunes and Associated Soils
3. Brown Soils
4. Sierozems
5. Red Loams
6. Hill Soils (Lithosols)
7. Saline Sodic Soils (Solonchaks)
8. Alluvial Soils/and Black Soils



Desert Soils

- **Districts-** Nagaur, Jodhpur, Jalore, Barmer, Hanumangarh, Sriganganagar, Churu, Jhunjhunu and Sikar.
- **Rainfall-** Less than 400 mm
- **Texture-** Sandy to Sandy loam
- It contains a high percentage of soluble salt & has high Ph value.
- It has varying percentage of calcium carbonate & generally poor in organic matter.
- These soils are pale brown, single grained, deep and well drained.
- Calcium carbonates sometime occur in form of *Kankar nodules* which increases with depth.
- In most of the desert soils nitrogen is low. Range - 0.02% to 0.07%

- It is not fertile but it can be made fertile for agricultural crops and plants where water supply is regular by putting phosphates with nitrates Under normal rainfall Kharif crops (summer) are grown but failure of crops due to low rainfall is common.

Dunes and Associated Soils

- **Districts** - Barmer, Bikaner, Jaisalmer, Jaipur, Jodhpur, Churu
- **Texture** - loamy fine sand to coarse sand and may or may not be calcareous.
- These soils are yellowish brown in colour sandy to sany loam, deep and well drained
- Calcium carbonate, sometime occur in the form of Kankar nodules which increases with depth.
- Cultivation is practiced in rainy season on the slopes of low to medium high dunes and usually rainfed Bajra or Kharif pulse are grown.
- These have been grouped separately from desert soils as they are only deposited sand and little profile development has taken place.
- Dunes are of varying heights from low shifting dunes to high and very high stabilized dunes.

Brown Soils

- **Districts** - Tonk, Bundi, Sawai Madhopur, Bhilwara, Udaipur and Chittorgarh
- **Annual Rainfall** - 50 cm to 75 cm is sufficient for Kharif crops.
- **Texture** - Sandy loam to clay loam.
- **Colour:** Ranges from grayish brown to yellow brown.
- Major area of these soils is in the catchment area of Banas River.
- They are rich in calcium salts but have poor organic matter
- Use of fertilizers becomes essential to get good harvest
- As the ground waters are saline, soils irrigate with these waters have accumulated salts
- Tank irrigated soils have also developed problem of high water table.
- Rabi crops are grown under irrigation.

Sierozems

- **Districts** - Pali, Nagaur, Ajmer, Jaipur, Dausa (lies on both the side of Aravalli Hills)
- **Annual Rainfall** - 50 cm to 70 cm
- **Texture** - Sandy loam to Sandy clay
- **Color:** They are mostly yellowish brown
- The rainfall in the area in higher than the desert of the extreme west
- Natural vegetation is also seen at some places.
- The soils are suitable for cultivation but for low rainfall and high evaporation.
- Kharif crops are rainfed and Rabi crops are grown through well irrigation.
- In the Kharif crops Bajra, Jowar, pulses are grown and in Rabi crops wheat, mustard & vegetables are grown.

Red Loams

- **Districts** - Dungarpur, Banswara & parts of Udaipur, Chittorgarh
- **Rainfall** - 70 cm to 100 cm
- **Texture** - Sandy loam to sandy
- These soils are reddish in colour with granular/crumb structure & well drained.
- These soils have rich content of iron-oxide and devoid of calcium salts because calcium salts soluble in water and are easily washed away.
- Soils are suitable for maize, chilies, wheat, barley and rapeseed cultivation
- Parent material of these soils is the red sandstone or yellow sandstone which is found in Vindyan rocks.

Hill Soils (Lithosols)

- **Districts** - At the foot hills of Aravalli in Sirohi, Pali, Nagaur, Udaipur, Rajsamand, Chittorgarh, Bhilwara and Ajmer
- **Colour** - Reddish to yellowish red to yellowish brown
- **Texture** - Sandy loam to clay and well drained.

- Cultivation of crops in these soils is very much restricting due to shallow nature of these soils and presence of stones on the surface.
- Soil erosion due to water is another problem of these soils

Saline Sodic Soils (Solonchaks)

- Saline Sodic soils are seen in the far flood plains of river Ghaggar and in Luni Basin.
- **Districts** - In the natural depressions like the Pachpadra, Sambhar, Deedwana, Ranns of Jalore and Barmer
- **Colour** - Dark grey to pale brown
- Water table is sometime close to surface
- Cultivation is not possible due to the impeded drainage and high degree of salinity
- The only vegetation consists of some salt tolerant grasses and shrubs

Alluvial Soils/and Black Soils

- Districts - Sriganganagar (soil deposited by Ghaggar), Kota, Bundi, Baran, Jaipur.
- The soil is deficient in lime, phosphoric acid and humus.
- It varies from clayey to sandy loam in texture.
- The top soil contains '*kankar*' which lie either on sands or sandy clays.
- A wide variety of crops including wheat, rice, cotton and tobacco are grown in this soil.

New comprehensive system of soil classification

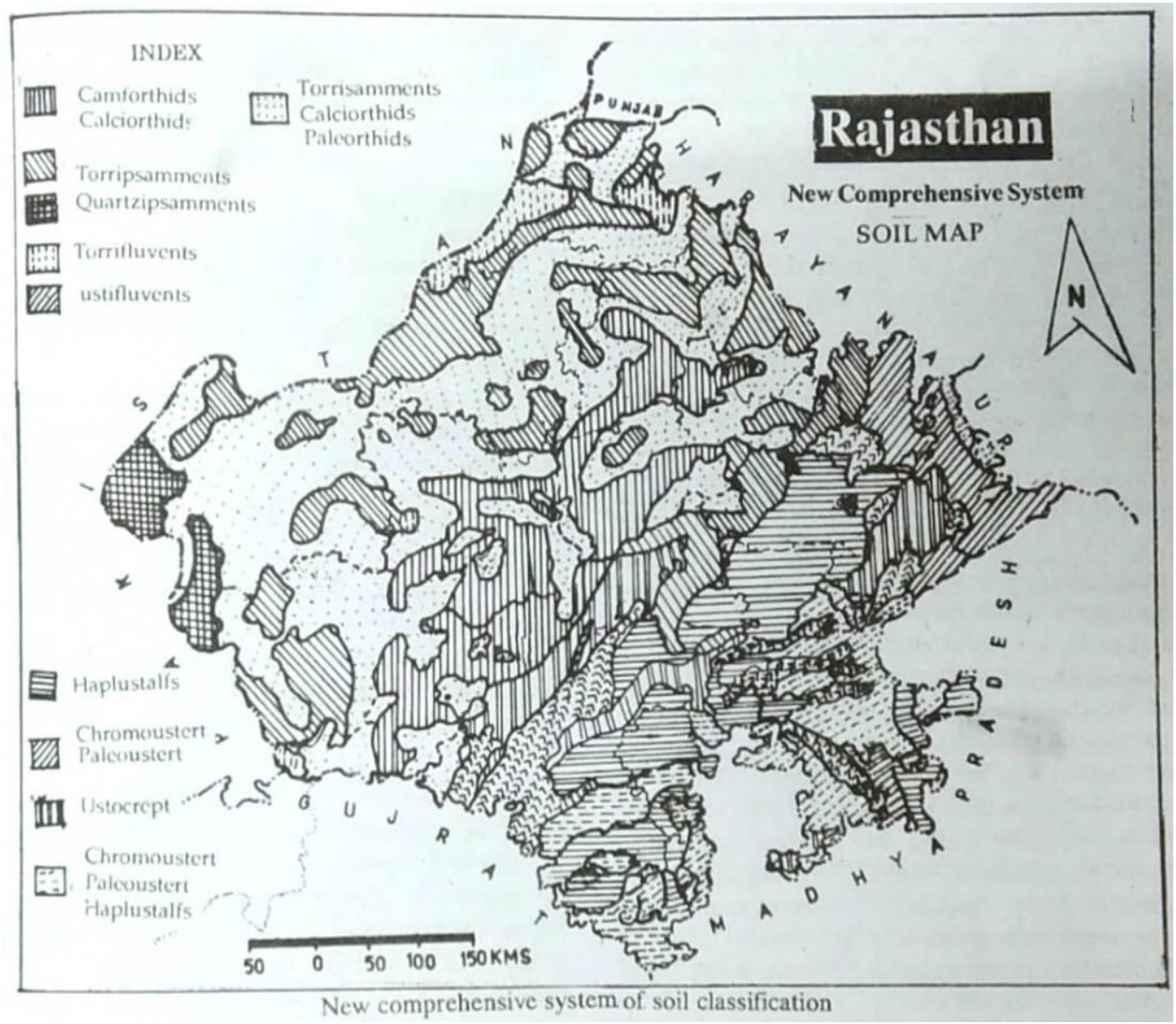
New soil taxonomy (properties) based comprehensive system of soil classification was developed by Soil Survey Staff in 1976. This new system has 10 soil orders, which are subdivided into 47 suborders and then 230 great groups, these great-groups are then subdivided into family and series. Under the new system, most soils of Rajasthan belong to only 5 orders - aridsols, alfisols, entisols, inceptisols and vertisols. These are further classified into sub-orders and great-groups as mentioned below:

Order - Suborder - Great group

1. Aridisols

- Orthids
  - Camb-orthids
  - Calci-orthids
  - Sal-orthids
  - Pale-orthids

2. Alfisols
   - UStalfs
     - Hapl-ustalfs
3. Entisols
   - Psamments/Fluvent
     - Torripsam
     - Quartzipsam
     - Torrifluvents
4. Inceptisols
   - Ochrepts
     - Ust-ochrepts
5. Vertisols
   - Usterts
     - Chrom-usterts
     - Pell-usterts



New comprehensive system of soil classification

1. Aridisols

- Aridisols are mineral soils mostly found in dry climatic.
- **Districts:** These occur extensively in the western half of Rajasthan divided by the Aravalli axis and some parts of Alwar, Jaipur and Ajmer districts which fall on the eastern half.
- Aridisols are found in association with soils of order **Entisols**.
- Major portion of Aridisols in Rajasthan is covered by the suborder **Orthids** .
- They commonly have horizons of accumulation of soluble salts and carbonates.

1.a. Camborthids

- These are brownish to reddish in colour.
- These are youngest of aridisols.

1.b. Calciorthids

- Calciorthids occur in the range of 100 to 500 mm rainfall range in the state.

1.c. Salorthids

- These soils are found scattered in Ghaggar flood plain in Sriganganagar, near Runn of Kachch area in Jalore and Barmer.
- These are salty soils of wet places in deserts.
- Vegetation is usually salt tolerant grasses and shrubs.

1.d. Paleorthids

- These soils have a petrocalcic horizon, very close to surface and quite thick.
- Their color changes from reddish brown to nearly white.
- These soils occur in small patches around Jaisalmer, Barmer and Nagaur.

2. Alfisols

- **Districts:** Parts of Jaipur, Alwar, Bharatpur, Sawai Madhopur, Tonk, Bhilwara, Chittorgarh, Banwara, Udaipur, Dungarpur, Bundi, Kota and Jhalawar.
- These are mature soils with medium to maximum profile development.
- **Color:** Reddish to Brownish
- **Annual rainfall:** 500 to 900mm
- Most of the area covered Alfisols in Rajasthan comes under only one suborder - ustalfs and one great group -
    - 2.a. Haplustalfs

3. Entisols

- Entisols lack well developed horizons and have minimum profile development.
- **Districts:** Entisols are **dominant soil** of the state. All districts in western half are covered in some or major part by these soils.
- In Rajasthan, important suborders are: Psamments, Orthents and Fluvent.

3.a. Torripsam

- These occur on sand dunes and in flood plains.

3.b. Quartzipsam

- These occur on the western border of Rajasthan covering small parts of Jaisalmer and Barmer.

3.c Torrifluvents

- These Soils occur with Calciorthids and Salorthids in the Ghaggar area of Sriganganagar district.
- **Annual Rainfall:** Does not exceed 300 mm.

4. Inceptisols

- **Districts:** Along the foothills of the Aravalli in the districts of Sirohi, Pali, Udaipur, Bhilwara, Chittorgarh and in some parts of alluvial plains in Udaipur, Alwar, Sawai Madhopur and Jhalawar.
- **Color:** Reddish and brownish.
- In Rajasthan these soils are classified as:
    - 4.a. Ustochrepts

5. Vertisols

- **Districts:** Jhalawar, Kota, Bundi and small part of Sawai Madhopur, Bharatpur, Dungarpur, Chittorgarh and Banswara.
- They are clayey soils that develop deep wide cracks when dry and become sticky & plastic when wet.

- They are compact and very slowly permeable in the lower layer.
- Soils of Rajasthan come under sub-order of **Usterts** and associated with two great-groups.
    - 5.a Chromusterts
    - 5.b Pellusterts

Conservation of Soils of Rajasthan

Rajasthan is the state with highest area under desertification (land degradation) with respect to country's total geographical area (TGA). The state has 62.90% of the TGA under desertification/ land degradation for the period of 2011-13. The desertification/ land degradation area in Rajasthan has decreased about 0.29% since 2003-05.

Definitions & Differences:

Soil Degradation

- Soil degradation is the decline in soil quality caused by its improper use, usually for agricultural, pastoral, industrial or urban purposes.
- Soil degradation is a serious global environmental problem and may be exacerbated by climate change. It encompasses physical (soil erosion), chemical (salinity and alkalinity, pollution) and biological deterioration (pollution and deterioration of vegetal cover).

Soil Erosion

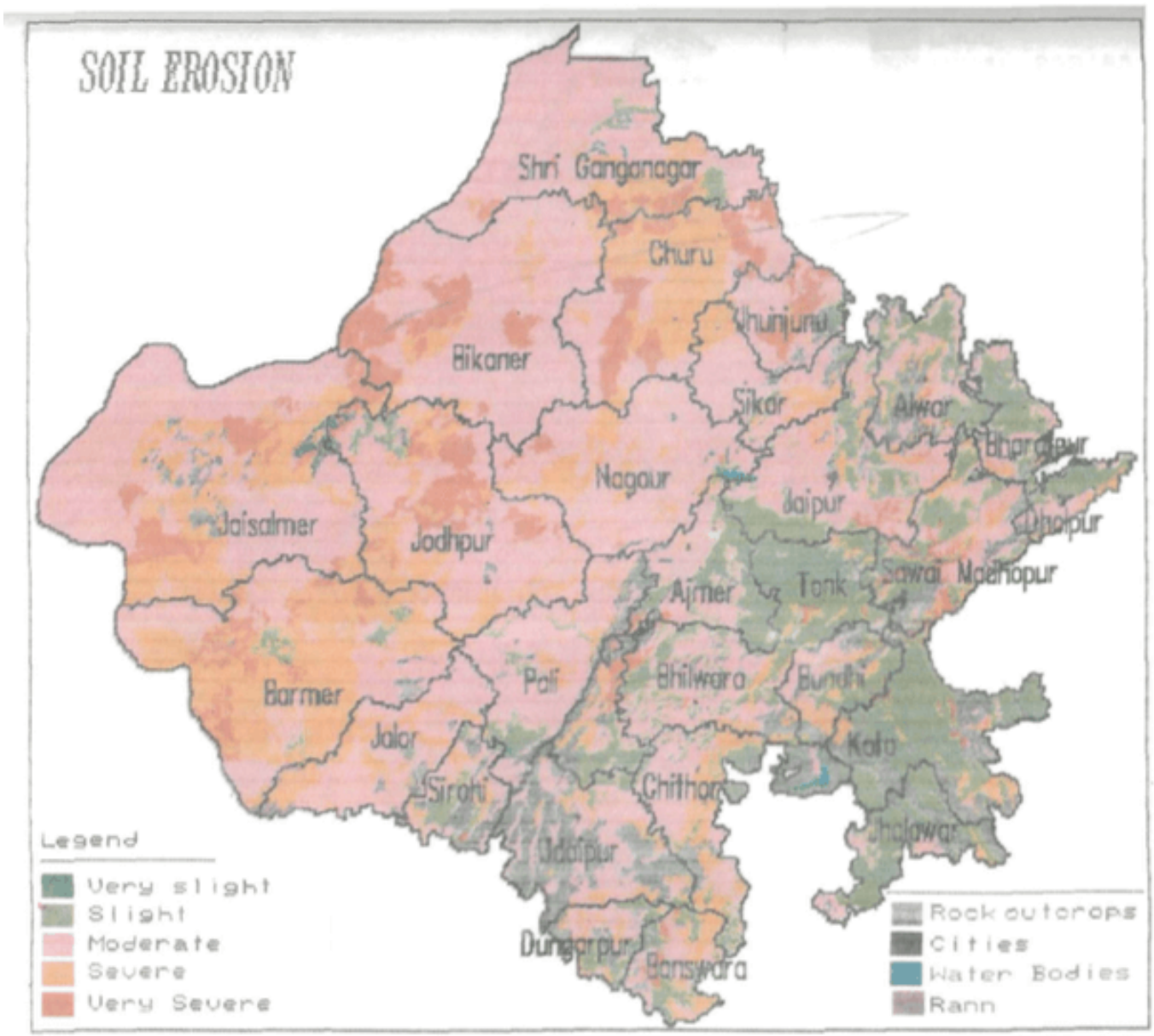
- Soil erosion is the removal of top soil by agents like wind and water.
- Top soil has most of the nutrients necessary for a plant's growth. With depth, the fertility of the soil decreases. Thus, erosion results in reduction of fertility of the soil by washing away the fertile top layer.

Desertification

- UNCCD defines desertification as 'land-degradation in arid, semi-arid and sub-humid areas resulting from various factors including climatic variations and human activities'.
- Loss of soil cover, mainly due to rainfall and surface runoff, is one of the biggest reasons for desertification.

Problems of Soils in Rajasthan

The degree of degradation and its severity are influenced by special variability and its niche with the surrounding. The terrain factors like slope, aspect, topographic position are found to be dominant factor while intensity and distribution of rainfall are climatic factors, determining the extent and severity of degradation.



Wind Erosion & Shifting Sand Dunes:

- Wind Erosion is the **most significant cause** of land degradation/desertification in Rajasthan.
- The wind erosion is playing a prominent role, in the western flank of the state and is found active with full force in the core of desert, causing sand blasting, sand drifting, which results active dunes and interduneal plains.

Water Erosion

- Severity of water erosion is found at the peak in central highland, including Aravalli landscape and Bundelkhand upland.
- This causes loss of top soils through sheet and rill erosion.
- It also causes terrain deformation through gully and ravine land. Example: Ravine Lands along the Chambal River & its tributaries.

Water Logging:

- With the introduction of canal irrigation system water table of the area is rising at an average rate of about 0.8 m per year.
- As a result of this large area has become water-logged and this area is increasing every year, it is a serious problem particularly in deep black soils.

Sodicity of Soil:

- Sodality of the soil and high residual sodium carbonate content of irrigation water are the main problems.

Salinity & Alkalinity:

- The Salinity & Alkalinity is found maximum in the Aravalli and Bundelkhand alluvial plains where the quality of ground water and poor management practices about the secondary salinization.
- Salinity is due to high permanent water table.

Steps for Soil Conservation in Rajasthan

Adequate Drainage:

- The solution for **salinity & Alkalinity** of soil is to provide of soil is to provide adequate drainage.

Use of Gypsum:

- Use of gypsum which is abundantly and cheaply available in Rajasthan, is economical and long term solution to the problem of **Alkalinity**.

Afforestation:

- Large scale planting of saplings which act as wind breaks & also prevents soil erosion through water.

Shelter Belts:

- In dry regions rows of trees are planted to check wind movement to protect soil cover.

Contour Barriers:

- Stone, gross, soils are used to build barrier along contours. Trenches are made in front of the boomers to collect water.

Grass Development:

- Plantation of trees & grasses on marginal and sub marginal land.

Wind strip cropping:

- Grass and crop strip at right angle to wind direction.

Stubble Mulching:

- Crop stubbles are left in the field and next crop planted with minimum tillage.

Contour Bonding:

- Ravine land can be made cultivable by leveling followed by contour bonding
- The medium and deep gullies can also be converted into productive wood lands.

Proper Drainage System in canal Project Area:

- The problem of water logging can be checked and overcome by introducing proper drainage system in the canal project area.

DryFarming:

- Dry Farming is a method of conserving soil moisture preventing soil erosion.

RockDam:

- Rock Dam is built to slow down its flow of water.

Mulching:

- A layer of organic matter is made on soil. It helps to retain soil moisture.

Intercropping:

- Different crops are grown in alternative rows to protect the soil form rain wash

Terrace Farming:

- Broad flat steps or terraces are made on the steep slopes so that flat surfaces are available to grow crops.
- They reduce surface run off & soil erosion.

Contour Plugging:

- Plugging parallel to the contours of a hill slope to form a natural barrier for water to flow down the slope

Agro-climatic Zones of Rajasthan

The entire country has been delineated into 126 agro-climatic zones by the Indian Council of Agricultural Research (ICAR). Similarly, Rajasthan has been divided into 10 agro-climatic zones. These zones have been classified on the basis of agro-climatic parameters like rainfall, temperature regime, topography, soil characteristics, cropping pattern and irrigation availability. The Agro-climatic zones of Rajasthan are as follows:

1. Arid North Western Sandy Plain
2. Irrigated North Western Plain
3. Hyper Arid Partial Irrigated Zone
4. Transitional Plain of Inland Drainage
5. Alluvial Plain of Luni Basin
6. Semi Arid Eastern Plain
7. Flood Prone Eastern Plain
8. Sub Humid Southern Plain and Aravallis
9. Humid Southern Plain
10. Humid South Eastern Plain

Arid North Western Sandy Plain

- **Rainfall:** The mean annual rainfall in this zone is 100 to 400mm. The zone has erratic and uncertain rainfall witnessing frequent droughts.
- **Area:** The plain is characterized by vast sandy plain with sand dunes, sandy plain pediments and palayas present in the region. The vast area covered with sand dunes has coarse textured soil with CaCO3 and gypsum. This physiographic zone is located in the north western part of the state covering Jaisalmer, Barmer, Bikaner and Jodhpur districts.
- Groundwater is deep and saline but at few places tube-well water is used for irrigation.
- Rain-fed agriculture is practiced in some pockets and livelihood is primarily livestock based.

Irrigated North Western Plain

- **Area:** This plain extends in the northern part of the state in Ganganagar, Hanumangarh and north western part of Bikaner district.
- As the zone is irrigated by network of Indira Gandhi Canal, Bhakra and Gang canal, it is intensively cultivated.
- The plain is dominantly covered by the medium and fine textured deep to very deep soils. The bed of River Ghagghar stretching from Suratgarh to Anupgarh is fine textured and intensively cultivated. I
- n addition, in the southern and eastern part the region there is vast Aeolian plain covered with dunes with small area of deep buried pediments.

Hyper Arid Partial Irrigated Zone

- **Rainfall:** The normal rainfall in the zone is 185 to 390 mm.
- **Area:** This zone is spread in the arid region of Bikaner, Jaisalmer and parts of Churu, where the farmers have partial dependence on the sources of irrigation.
- The region has desert soil characterized by sand dunes and aeolian soil. The soil is loamy coarse in texture and with calcareous characteristics.

Transitional Plain of Inland Drainage

- **Rainfall:** The zone has average rainfall of 300-400mm.
- **Area:** This plain is spread in the central part of the state covering western, eastern and northern part of Nagaur and entire Sikar, Churu and Jhunjhunu districts.
- There is no drainage out of this area.
- The zone is covered with sandy plain, sand dunes and occasional hills. The area distinguishes from western sandy plain in having better Livelihood of villagers depends mainly on livestock rearing along with some rain-fed farming.

Alluvial Plain of Luni Basin

- **Rainfall** ranges between 400 and 500mm.
- **Area:** The physiographic zone is located in the central part of the state where a number of ephemeral streams and River Luni and its tributaries flow through this area covering Pali, Jalore, part of Nagaur, Jodhpur and Barmer districts.
- Water is saline in this zone.
- Cultivation of cash crops is Rainfed or done with the help of tube-wells. Dominant soils are medium to fine textured.

Semi Arid Eastern Plain

- **Rainfall:** Average Rainfall in the zone about 500- 700mm.
- **Area:** This plain is drained by the river Banas and its tributaries.
- The zone is spread in the eastern part of the state covering Jaipur, Ajmer, Dausa and Tonk districts. The plain is sandy plain.
- Occasional sand dunes and buried pediments and scattered hills with substantial area under alluvium are features of this zone.

Flood Prone Eastern Plain

- **Rainfall:** The rainfall in the zone is 600-700mm.
- **Area: T**his zone extends in Alwar, Bharatpur and Dholpur districts. Soils are yellowish-brown to dark yellowish brown, sandy loam to clay loam and non-calcareous.
- This zone developed on the alluvium deposited by the river Yamuna and its tributaries and is spread over the eastern part of the state and forms western fringe of the Indo-Gangetic plain.
- A large area of this zone is under kharif and rabi crops.

Sub Humid Southern Plain and Aravallis

- The zone receives 700-900mm rainfall.

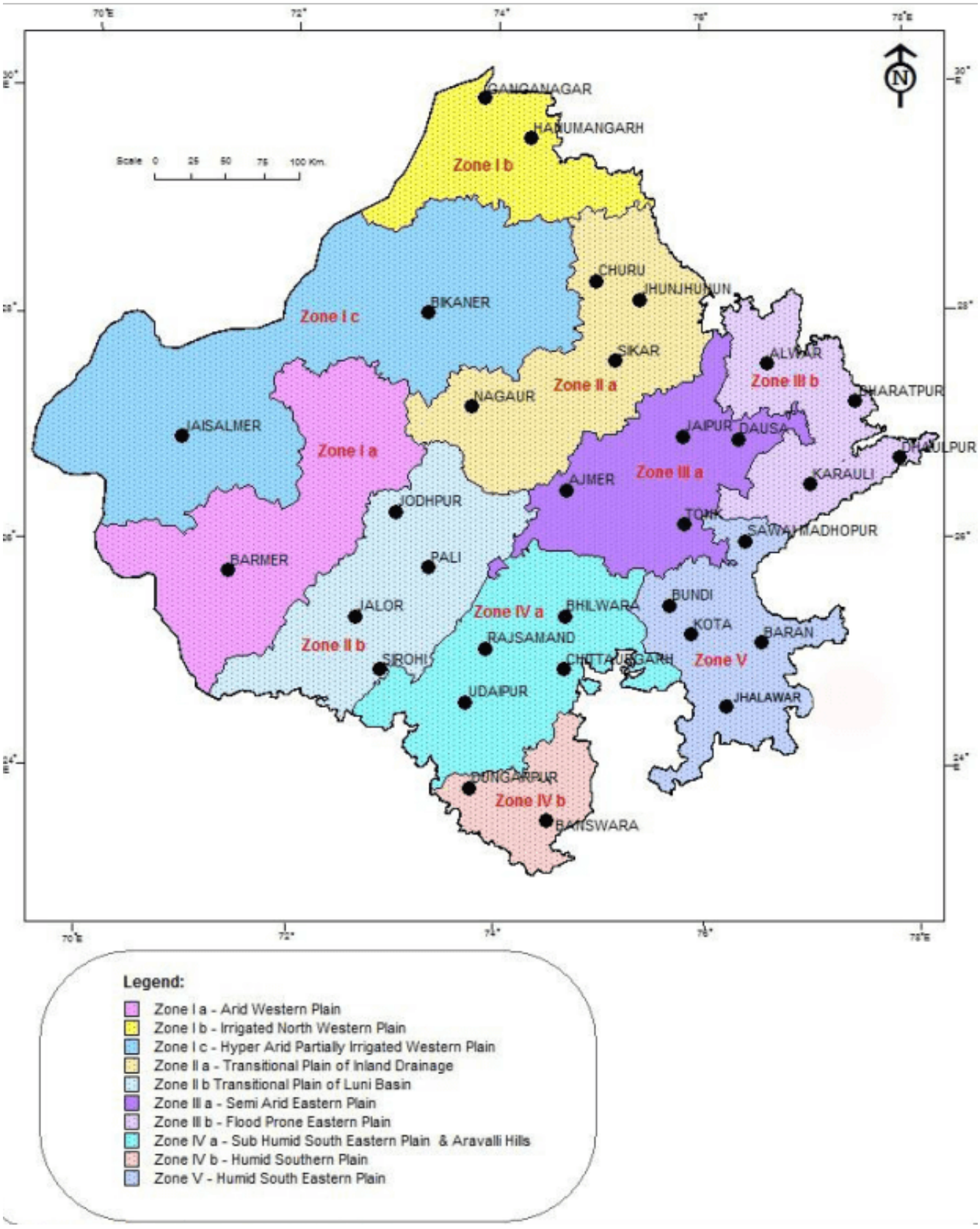
- High hills are scattered through the zone and there is a contiguous appearance of the Aravalli hills, running south to north.
- The zone extends in the southern part of the state in Bhilwara, Rajsamand, Sirohi, Udaipur and Chittorgarh districts.
- Hills and pediments are under hills for rest which support natural vegetation cover including trees, shrubs and grasses.
- Cultivated land occurs in between the hills.
- Medium to fine textured deep soils are dominant in this region.

Humid Southern Plain

- This zone receives 900-1000mm rainfall.
- This plain characterized by hills and valley fills is spread in the southern part of the state in Dungarpur, Banswara and Pratapgarh districts.
- In Banswara and Pratapgarh districts the soils formed from lava flow of basalt are also found.
- In between, scattered areas of deep buried pediments are also encountered.
- The hills are covered with thick density of trees, shrubs and grasses.

Humid South Eastern Plain

- This zone receives the highest rainfall in the state of around 700-1000mm.
- **Area**: South-eastern part of the state covering Sawai Madhopur, Karauli, Jhalawar, Baran, Kota and Bundi districts.
- The landscape is characterized by hills pediments and vast alluvial plain formed by the rivers Chambal, Parbati, Parwan, Kalisindh and their tributaries. Because of these rivers deep gullies and ravines have been formed. Because of the presence of fine textured alluvium deposited by the rivers in this zone the land is very productive


GANGANAGAR
HANUMANGARH
Zone I b
CHURU
JHUNJHUNUN
BIKANER
Zone I c
SIKAR
ALWAR
Zone III b
Zone II a
NAGAUR
BHARATPUR
JAISALMER
JAIPUR
DAUSA
Zone I a
DHAULPUR
AJMER
Zone III a
KARAULI
JODHPUR
TONK
SAWAIMADHOPUR
BARMER
PALI
BUNDI
JALOR
Zone IV a
BHILWARA
KOTA
Zone II b
RAJSAMAND
BARAN
SIROHI
CHITTAURGARH
Zone V
UDAIPUR
JHALAWAR
DUNGARPUR
Zone IV b
BANSWARA
Legend:
Zone I a - Arid Western Plain
Zone I b - Irrigated North Western Plain
Zone I c - Hyper Arid Partially Irrigated Western Plain
Zone II a - Transitional Plain of Inland Drainage
Zone II b Transitional Plain of Luni Basin
Zone III a - Semi Arid Eastern Plain
Zone III b - Flood Prone Eastern Plain
Zone IV a - Sub Humid South Eastern Plain & Aravalli Hills
Zone IV b - Humid Southern Plain
Zone V - Humid South Eastern Plain

Land Use pattern of Rajasthan

Land use pattern of an area affects vegetation, land quality, local weather and quality of life. It is very important to understand the land use pattern of any area and the dynamics of its shift overtime. This determines the ensuing per unit load on agriculture land, forest land, periphery areas to cities and factors responsible for land degradation. The land use pattern of a region determines the ecological balance in the region and helps to understand the environmental status as well.

Important Definitions:

Geographical Area:

- The latest figures of geographical area of the State/Union Territories are as provided by the Office of the Surveyor General of India.

Reporting Area for Land Utilisation Statistics:

- The Reporting area stands for the area for which data on land use classification are available.
- As per Rajasthan Economic Review 2020-21, published in 2021 – *the total reporting area of the State is 342.87 lakh hectare during the year 2018-19*.

Net Area Sown:

- This represents the total area sown with crops and orchards. Area sown more than once in the same year is counted only once.

Forest Area:

- This includes all land classified either as forest under any legal enactment, or administered as forest, whether State-owned or private, and whether wooded or maintained as potential forest land.
- The area of crops raised in the forest and grazing lands or areas open for grazing within the forests remain included under the "forest area".

Area under Non-agricultural Uses:

- This includes all land occupied by buildings, roads and railways or under water, e.g. rivers and canals, and other land put to uses other than agriculture.

Culturable Waste Land:

- This includes land available for cultivation, whether taken up or not taken up for cultivation once, but not cultivated during the last five years or more in succession including the current year for some reason or the other .
- Such land may be either fallow or covered with shrubs and jungles which are not put to any use. They may be accessible or inaccessible and may lie in isolated blocks or within cultivated holdings.

Barren and Un-culturable Land:

- This includes all land covered by mountains, deserts, etc. Land which cannot be brought under cultivation except at an exorbitant cost is classified as un-culturable whether such land is in isolated blocks or within cultivated holdings.

Permanent Pasture and other Grazing Land:

- This includes all grazing land whether it is permanent pasture/meadows or not.
- Village common grazing land is included under this category.

Land under Miscellaneous Tree Crops, etc:

- This includes all cultivable land, which is not included in 'Net area sown' but is put to some agricultural use.
- Land under casuring trees, thatching grasses, bamboo bushes and other groves for fuel, etc. which are not included under 'Orchards' are classified under this category.

Current Fallows:

- This represents cropped area which is kept fallow during the current year.

Fallow Lands other than Current Fallows:

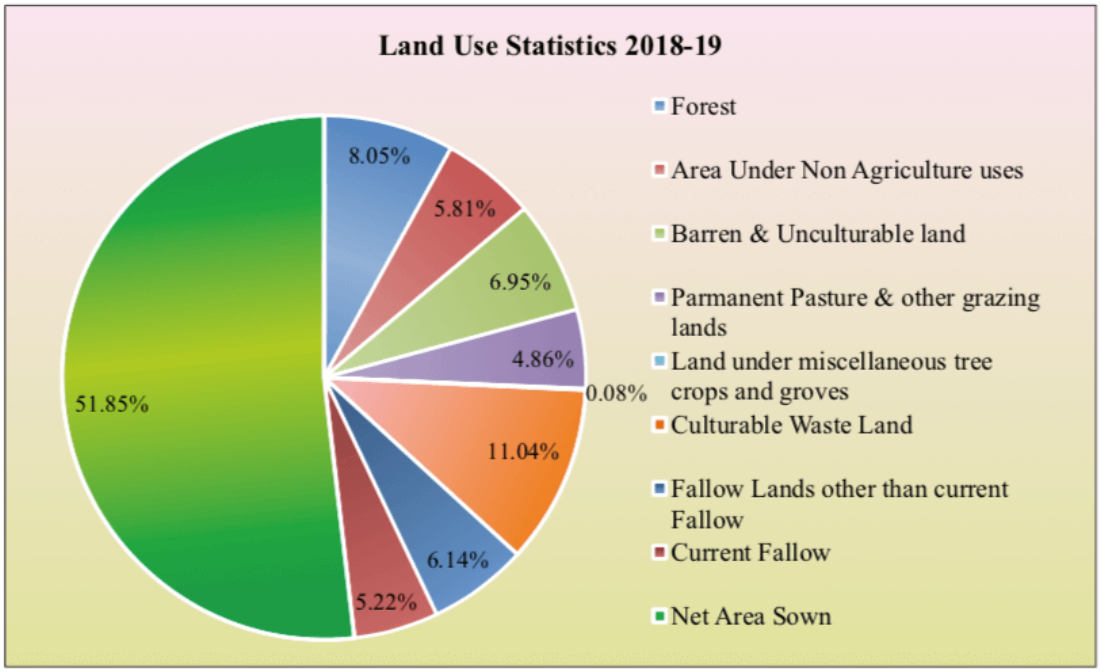
- This includes all land which was taken up for cultivation but is temporarily out of cultivation for a period of not less than one year and not more than five years.

Land-Use Pattern in Rajasthan

As per Rajasthan Economic Review 2020-21, published in 2021 – the total reporting area of the State is 342.87 lakh hectare during the year 2018-19. Land use pattern in Rajasthan is as follows:

Land Use Pattern in Rajasthan

S.NO	Land Use	Area (in Lakh Hectare)	Percentage
1	Net Sown Area	177.78	51.85
2	Area under Forests	27.60	8.05
3	Non Agricultural Uses	19.93	5.81
4	Permanent Pastures & other grazing land	16.68	4.86
5	Land under Misc. trees & grooves	0.26	0.08
6	Culturable Wasteland	37.84	11.04
7	Fallow Lands (other than current fallow)	21.06	6.14
8	Current Fallows	17.89	5.22
9	Barren & Uncultivable Land	23.83	6.95
	Reporting Area for Land Utilization	342.87	100
	Total Reported area of Rajasthan	342.87	



Irrigation in Rajasthan

Rajasthan, with a geographical area of 342.87 lakh hectare, is the largest State in the country, having 10.40 per cent of the total area of the country. Despite being the largest state in terms of area, only 1.16 per cent of total water resources is available in the state.

Different irrigation sources have been developed in different parts of the state due to the variation of land structure, surface and water availability in Rajasthan.

Important Definitions:

Gross Cropped Area:

This represents the total area sown once and/or more than once in a particular year, i.e. the area is counted as many times as there are sowings in an agriculture year (i.e. from the 01st July to 30th June next year). This total area is also known as total cropped area or total area sown.

Net Area Sown:

This represents the total area sown with crops and orchards. Area sown more than once in the same year is counted **only once**.

Area Sown more than once:

This represents the areas on which crops are cultivated more than once during the agricultural year. This is obtained by deducting Net Area Sown from Gross Cropped Area.

Irrigation Potential Created (IPC)

It is the area that can be irrigated from a project in a design agriculture year (i.e. from the 01st July to 30th June next year) for the projected cropping pattern and accepted water allowance on its full development.

At the time of independence, and there were 1 major, 43 medium and 2272 minor projects in the State with irrigation potential of only **4 lac ha**.

Irrigation Potential Utilised (IPU)

The Irrigation potential utilised is the total gross area actually irrigated by a project/scheme during the agricultural year under consideration.

Ultimate Irrigation Potential (UIP)

The ultimate irrigation potential is the gross area that can be irrigated from a project in a design agriculture year (i.e. from the 01st July to 30th June next year) for the projected cropping pattern and assumed water allowance on its full development.

Gross Irrigated Area:

The area irrigated under various crops during a year, counting the area irrigated under more than one crop during the same year as many times as the number of crops grown and irrigated.

Net Irrigated Area:

It is the area irrigated through any source once in a year for a particular crop.

Total Net Un-irrigated Area:

It is the area arrived at by deducting the net irrigated area from net sown area.

Total/Gross Un-Irrigated Area:

It is the area arrived at by deducting the gross irrigated area from the gross sown area.

Cropping Intensity:

It is the ratio of Net Area Sown to the Total Cropped Area.

Irrigation Statistics in Rajasthan:

As per Rajasthan Economic Review 2020-21:

- The reported total area of state is 342.87 lac hectare.
- Net Sown Area - 177.78 lac hectare.

Gross Irrigated Area in Rajasthan by Source

As per Rajasthan Economic Review 2020-21, published in 2021, the total net irrigated area of Rajasthan was 110.21 lac hectares in 2018-19. Out of this,

S.NO	Land Use	Area (in Lakh Hectare)	Percentage
1	Open Wells & Tube Wells	74.85	67.91 %
2	Ponds	0.35	0.32%
3	Canals	33.36	30.26%
4	Other Sources	1.64	1.48%
5	**Total**	**110.21**	

Net Irrigated Area in Rajasthan by Source

As per Rajasthan Economic Review 2020-21, published in 2021, the total net irrigated area of Rajasthan was 82.82 lac hectares in 2018-19. Out of this,

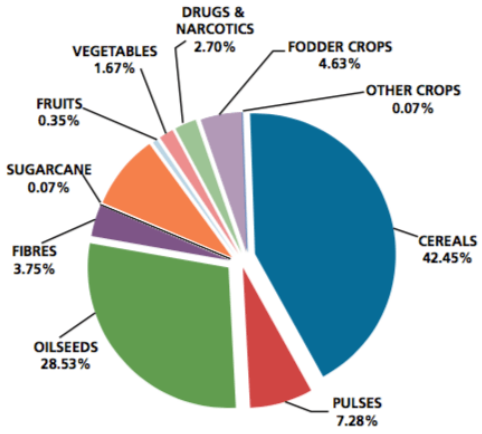
S.NO	Land Use	Area (in Lakh Hectare)	Percentage
1	Open Wells & Tube Wells	60.69	73.27%
2	Ponds	0.35	0.42%
3	Canals	20.16	24.34%
4	Other Sources	1.61	1.95%
5	**Total**	**82.82**	

As seen from above:

- Wells are the main means of irrigation in the state.

Irrigation in Rajasthan by Crops:

Of the total irrigated area, 35.79 percent is under wheat, 23.65 percent under rape seed and mustard, and 5.8 percent under grams.



Rajasthan Irrigation Potential

The state's estimated irrigation potential is 5.1 million hectares, of which 4.29 million hectares is already achieved.

Agriculture & Water Resource:

- Agriculture consumes about 83 percent of the state's water resources

Acts related to Irrigation:

- The Rajasthan Irrigation and Drainage Act, 1954

Organisations related to Irrigation:

- Irrigation Management & Training Institute, Kota
- Watershed Development and Soil Conservation Department
- Command Area Development & Water Utilization Department
- Indira Gandhi Nahar Department

Famines & Droughts in Rajasthan

The state of Rajasthan is prone to famine and droughts, particularly the western-most districts consisting of Thar desert which often experience successive years of scarcity and droughts.

Types of droughts:

Put simply, a drought is a failure of rain, leading to moisture stress, that in turn leads to agricultural losses and other forms of social and economic hardship. There are many definitions and classifications of drought, including that of the National Commission on Agriculture (quoted in Bokil 2000) which has defined three types of drought:

- **Agricultural drought:**
    - When crops are affected due to moisture stress and lack of rainfall.
- **Meteorological drought:**
    - When there is more than 25 per cent decrease (from normal) in rainfall in any area.
- **Hydrological drought:**
    - When recurring meteorological droughts result in decrease in surface water and groundwater levels.

Under this classification. if drought occurs in 20 % of the years in any area, it is classified as *drought prone area* and if the drought occurs in more than 40 % of the years. it is classified as *chronically drought prone area*.

Causes of droughts in Rajasthan:

Droughts in the Indian sub continent are mainly due to failure of rainfall from southwest monsoon. The root cause for failure of monsoon rainfall is cued to the widespread, persistent atmospheric subsidence, which results from the general circulation of the atmosphere. Recent studies on interactions between global circulations and drought showed that the EI Nino phase of the Southern Oscillations (EN SO) has the largest impact on India though drought.

Declaration of drought in Rajasthan:

The Scarcity Manual (formerly known as the Famine Code) for Rajasthan lays out the rules and procedures to be followed in declaring a drought.

While the Scarcity Manual includes many criteria, in practice, the State government has come to rely almost exclusively on the *girdawari report* and the losses in sowing and production reported therein. The *girdawari report* is a land-use report and is prepared by the patwari (land records official) of each panchayat. To calculate the losses, the current year's figures are compared with area sown and production in "normal" years (defined as the average production for the past few years). On the basis of this, calculations of affected population are made. The other criteria in the Scarcity Manual include distress migrations, increase in thefts, news of starvation deaths, etc.

Difference between droughts and famine

While, droughts and famine may seem referring to same thing. However, in actuality there is a huge difference. **Famine** is a widespread scarcity of food, caused by several factors including war, inflation, crop failure, population imbalance, or government policies. This phenomenon is usually accompanied or followed by regional malnutrition, starvation, epidemic, and increased mortality.

Frequency of Droughts in Rajasthan

Low rainfall coupled with erratic behaviour of the monsoon in the state make Rajasthan the most vulnerable to drought. Based on historical data the frequency of occurrence of droughts in the state is given in following table.

S. No.	Recurrence Period (Year)	Districts
1.	Once in 3 years	Barmer, Jaisalmer, Jalore, Jodhpur and Sirohi
2.	Once in 4 years	Ajmer, Bikaner, Bundi, Dungarpur, Sriganganagar, Nagaur, Hanumangarh and Churu
3.	Once in 5 years	Alwar, Banswara, Bhilwara, Jaipur Jhunjhunu, Pali, Sawai Madhopur, Sikar, Dausa and Karauli
4.	Once in 6 years	Chittorgarh, Jhalawar, Kota, Udaipur, Tonk, Rajsamand and Baran
5.	Once in 8 years	Bharatpur and Dholpur

Loss due Famine/Scarcity condition in Rajasthan

As per Economic Review 2019-20: Approximately 150 Lakh population of state across 21 districts was affected by famine & Scarcity in 2019-20.

Floods in Rajasthan

Popularly known as the desert state of India, Rajasthan is largely water deficit yet there are incidents of flood and there are flood prone areas in the state. In last 30 years, there have been multiple instances of floods in Rajasthan.

Flood Prone Areas of Rajasthan

The flood prone areas in Rajasthan include Ajmer, Barmer, Jodhpur, Pali, Jalore, Sirohi, Udaipur, Chittorgarh, Bundi, Kota, Jaipur, Jhalawar, Baran, Bharatpur, Alwar, Sri Ganganganagar districts. These regions spread across the Basins and Sub-Basins of the rivers Banas, Banganga, Chambal, Ghaggar, Luni, Mahi, Sabi, Shekhawati, Sukli and West Banas.

Categories of Floods

The categorization of floods is done on the basis of the average annual rainfall received at that centre as compared to the average rainfall of the observed 30 years. Accordingly, floods are classified as:

- **Moderate Floods:** If the excess of rainfall is 25 to 50 percent above the average rainfall of a specific region.
- **Severe Floods:** When the rainfall is more than 50 percent in a region.

Types of Floods in Rajasthan

Flooding of river and its catchment under the influence of excessive rainfall depending on the topography of the regions through which the rivers flows. The floods in rivers mostly occur either due to very heavy rainfall for a few days concentrated in a specific catchment or due to the obstructions that are caused either because of human interference by bridges or embankments that restrict the flow of the river or natural choking of river bed.

In Urban areas, flooding occurs usually because lack of proper planning, choking of damage systems and unplanned growth of the settlements during monsoons.

In rare cases, flooding can also be result of cloudburst that might happen in a specific area.

Impact of Floods in Rajasthan:

- Floods deplete all the sources of clean or drinkable water in the area.
- Floods leads to submergence of crops and hence, destroys agricultural produce.
- A huge of livestock perishes because of floods.
- The biggest threat after flood is curbing the spread of diseases like Diarrhea, Dysentery, Malaria, skin infections, Jaundice, Typhoid and Cholera.
- Infrastructure like roads, electricity distribution and communication network are also damaged during floods.

Flood Management in Rajasthan

The Disaster Management and Relief Department of Government of Rajasthan handle all the disasters in the state. The department has published a Flood Manual that gives a complete description of the flood response system of the state. Among other things, it streamlines department wise responsibilities of each department in case of floods.

Land Holding Pattern in Rajasthan

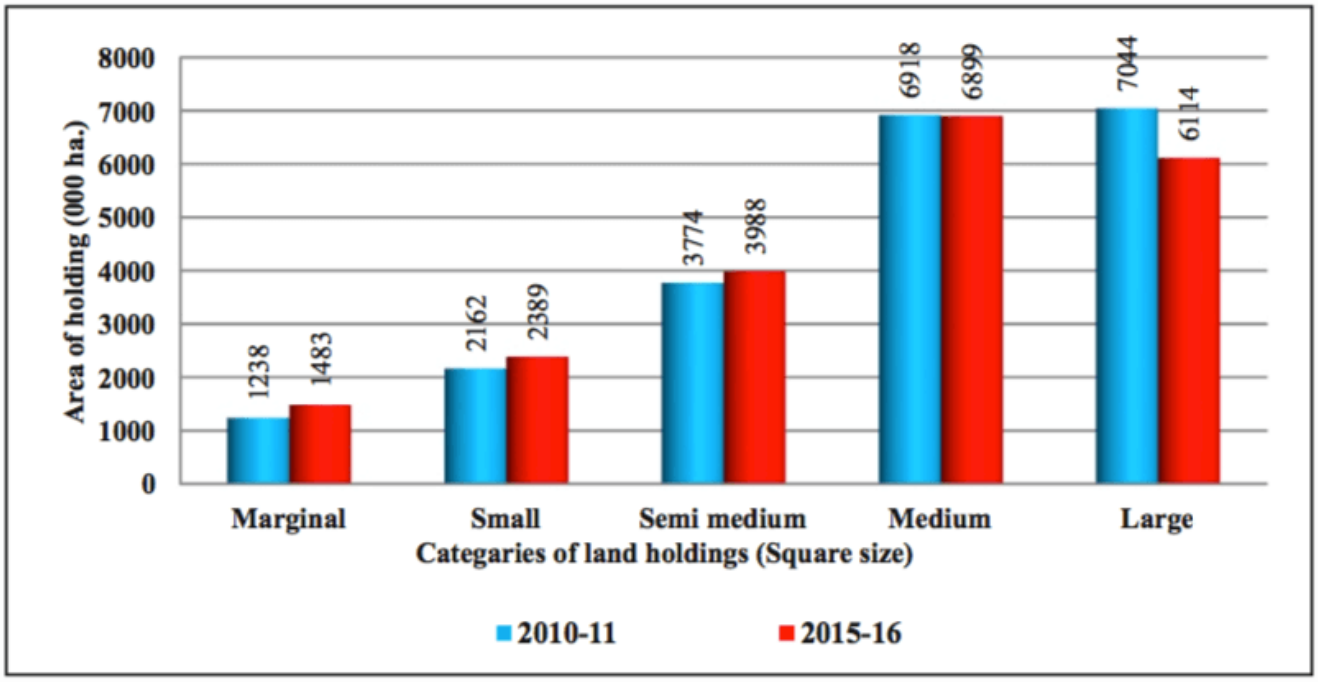
The agricultural census collects Primary and Secondary data on structure of **operational holdings** by different size classes and social groups in the state. Operational Holding refers to all land which is used wholly or partly for agricultural production and is operated as one technical unit by one person alone or with others without regard to the title, legal form, size or location.

Based on Size, there are five kinds of Land Holdings in India:

- Marginal holdings: Size 1 hectare or less
- Small holdings: Size 1 to 2 hectares
- Semi-medium holdings : Size 2 to 4 hectares
- Medium holdings: Size 4 to 10 hectares
- Large holdings: Size above 10 hectare

Land Holding Pattern in Rajasthan: Data

- As per provisional data for Agriculture Census 2015-16, total number of operational land holdings in the State was 76.55 lakh. Out of these:
    - Marginal - 40.12 %
    - Small - 21.90 %
    - Semi medium - 18.50 %
    - Medium - 14.79 %
    - Large holdings - 4.69 %
- There is an increase in the number of marginal, small, semi medium and medium land holdings and decrease is in number of large land holding in the year 2015-16 in comparison to the year 2010-11. This indicates that there is an increase in number of divisions of land due to splitting of joint families.


8000
7000
6000
5000
4000
3000
2000
1000
0
Area of holding (000 ha.)
1238
1483
2162
2389
3774
3988
6918
6899
7044
6114
Marginal
Small
Semi medium
Medium
Large
Categaries of land holdings (Square size)
2010-11
2015-16

Livestock of Rajasthan

Service Sector majorly drives economy of Rajasthan but Agriculture and allied activities continues to be chief source of livelihood in rural region. 55% of total area of Rajasthan is desert and so livestock of Rajasthan is one of the main source of livelihood. Other than providing source of livelihood, livestock also provides food security and insurance against poverty. Development of livestock sector has a significant beneficial impact in generating employment and reducing poverty in rural areas.

Livestock is the main source of animal protein for the population. It is estimated that more than 80% rural families keep livestock in their households. Contribution of animal husbandry sector to the GDP of the State has been estimated to be around 10.21 %. About 35% of the income of small and marginal farmers comes from dairy and animal husbandry. In arid areas the contribution may be as high as 50%

Basics of Livestock

- **What is Livestock?**
  - Livestock are animals that are domesticated and raised in an agricultural setting to produce commodities such as food, fiber, and labor.
  - They include cattle, goats etc
  - The breeding, maintenance, and slaughter of these animals, known as *animal husbandry*
- **What is Mixed Farming?**
  - Mixed farming is a farming system, which involves the growing of *crops* as well as the *raising of livestock*
- **What are the advantages of Mixed Farming?**
  - Mixed Farming offers highest return on farm business, as the by-products of both farm and livestock are properly utilized.
  - It provides work throughout year.
  - Provides efficient utilization of land, labor, equipment and other resources.
  - Crop by-products such as bus, straw, fodder are used for feeding of livestock and in return they provide milk.
  - Manures available from livestock are useful in maintenance of soil fertility.

- It helps in supplying all the food needs (food security) of the family members.
- Intensive cultivation is possible.
- Provides livelihood security in case of drought, floods.
- Milk cattle's provide draft animals for crop production and rural transport.
- Mixed farming increases social status of the farmer.

- **Importance of Livestock in Economy of Rajasthan:**
  - Livestock provide 35% of draft power in the state.
  - Rajasthan has 40% of Sheep stock in India.
  - More than 80% rural families keep livestock in their households.
  - Contribution of animal husbandry sector to the GDP of the State has been estimated to be approximately **8 %.** (Source: Animal Husbandry, Dept.)
- **Strengths of livestock of Rajasthan:**
  - Rajasthan has about 11.27 per cent of the livestock of the country.
  - The State accounts for about 6.98 per cent of cattle,
  - 11.94 per cent of buffaloes,
  - 16.03 per cent of goats,
  - 13.95 per cent of sheep and
  - 81.50 per cent of camels of the country.
  - The State contributed 12 per cent of milk and 32 per cent of wool to the nation's production in the year 2016-17.
  - Livestock provide 35% of draft power in the state.
  - More than 80% rural families keep livestock in their households. Contribution of animal husbandry sector to the GDP of the State has been estimated to be approximately **8 %.** (Source: Animal Husbandry, Dept.)
  - Rajasthan *ranks 2nd* in Milk production in India.
  - Rajasthan ranks 2nd in per capita milk availability.
  - Rajasthan *ranks 1st* in wool production in India.

- Rajasthan produces 10% of meat in India.
- Rajasthan Ranks 14th in egg production in India
- Constraints in development of Livestock in Rajasthan.
- Livestock is an unorganized sector and holdings are very small, further much of the livestock belongs to economically weaker section which restricts it to being just source of livelihood.
- Markets for livestock are also unorganized and suffers from inadequate investment by Public (State) & Private sector.
- Inadequate availability of quality breeds
- Lack of health &nutrition support, along with frequent occurrence of natural calamities that result in high occurrence of diseases and mortality.
- Rajasthan is majorly an arid region and there is inadequate availability of fodder & feed resources
- Inadequate infrastructure in terms of cooperatives, veterinary and knowledge support.

Types of livestock on basis of their utility:

- **Dairy (Milch) breeds:**
  - Cows (Females): Gives high amount of milk
  - Bull (Males): are not good for work at farm
  - Examples: shahiwal, Red Sindhi, Gir and Deoni
- **Draught breeds:**
  - Cows yield poor milk production
  - Bulls are good at draught and are used for carrying out agricultural work like tilling, irrigation and carting.
  - Examples Kangayam, Umblacherry, Amritmahal, Hallikar.
- **Dual Breeds:**
  - Cows are good at milk production
  - Bulls are good at doing work

- Examples Ongole, Hariana, Tharparker, Kankrej, Krishna valley, Rathi and Goalo Mewathi.

Draft Rajasthan Livestock & Dairy Development Policy 2019

Livestock production systems in State are mostly based on traditional knowledge, low cost agricultural residues and agro-byproducts leading to comparatively low productivity. Livestock development falls within the jurisdiction of the State Government. Hence it is the State's responsibility to formulate suitable policy guidelines for overall development of the sector and to ensure faster growth of the livestock sector including sub-sectors viz. small ruminants, horses, camels and poultry for increased productivity and income and to generate employment opportunities in rural areas.

Vision of Livestock Policy 2019

- Strengthening of the animal husbandry sector.
- Holistic growth of livestock sector in terms of productivity, production, product processing, marketing, quality & services.
- Conservation and improvement of the indigenous germplasm of livestock in order to increase productivity and protect bio-diversity.
- Modernization of the sector.
- Empowerment of ESWS families, especially women, by improving their household income through improved animal husbandry.

Aims and Objectives of the State Livestock Policy 2019

The State Livestock Policy aims at increasing livestock productivity and production in a sustainable manner, while protecting the environment, preserving animal bio-diversity, ensuring bio-security and farmers' livelihood. With this goal, the main objectives of the policy are as under:

- Support the existing low input production systems for improving productivity and income.
- To provide an enabling environment for the growth and development of the livestock sector by providing quality services and inputs.

- To encourage establishment and growth of financially viable medium and large commercial livestock production units capable of adopting latest technology including facility for processing and value addition.
- To promote conservation of animal bio-diversity; conservation and genetic improvement of important indigenous breeds of livestock and poultry in the State.
- To encourage conservation of indigenous breeds of animals with special emphasis on Cattle, Camel and Horses.
- To increase availability of feed and fodder resources to meet the requirement of livestock to attain optimal productivity.
- To strengthen overall animal health cover through prevention, control and eradication of various disease conditions and encourage/enable the dairy cooperatives to extend veterinary services to farmers.
- To focus on production of quality livestock products as per the international standards for food safety.
- To encourage value addition of livestock products like milk and milk products, eggs, wool and meat & meat products etc.
- To expand capacity of milk handled by organized dairy sector including cooperatives.
- To provide logistic support to farmers for protection of livestock during natural calamities. Pastoralists need to be provided support for migratory animals.
- To provide insurance support for replacement of livestock and compensation of losses.
- To develop organic livestock production systems and focus on production of quality livestock products.
- To enhance banking and investment support and incentive to the sector.
- To ensure transmission and application of improved technology and management practices on the farmer's doorstep.
- To create an enabling environment to attract investment for improving infrastructure support, livestock production, processing, value addition and marketing in the sector.

Re-orientation of Breeding Policy for Livestock

- State would review the breeding policies for different livestock species on a regular basis.

Conservation of Animal Bio-Diversity

State has rich and diverse genetic resources of livestock in the form of a large number of species, breeds, and strains within a species. Rajasthan has some of the best breeds of cattle, sheep and goats. Some of these breeds have useful genes for faster growth and prolificacy. Such utility genes and breeds would be identified, conserved and utilized for breeding. The focus would be on conservation of indigenous breeds of livestock.

Pastoral communities, particularly those managing migratory animals like sheep, goats, camels etc. shall be supported through creation of facilities along their migratory routes for feeding, breeding, healthcare, housing, and market channels for their produce and animals.

Dairying

- Set up collection centres along the milk routes to increase procurement in the organized sector.
- Resources of both cooperative and private sectors would be synergized.
- Assistance to dairy cooperatives.
- Diversification of dairy products including probiotics would be promoted to meet local demands and for exports.
- Public Private Partnership initiatives would be supported

Feed and Fodder

- Avoid wastage of large quantity of straw and agro-industrial byproducts.
- Enhance availability of coarse grains and oil meals for livestock and poultry sector.
- Increase production of quality fodder seeds through necessary incentives, arranging foundation seeds of different high yielding fodder varieties and modern scientific farming procedures etc.
- Increase area under fodder cultivation, especially through use of barren and fallow lands and silviculture.

- Appropriate resources and technologies will be made available to ensure quality fodder seed production.
- Standards will be developed for compound feed for various species of livestock, including cattle, buffalo, pigs, sheep, goats and camels and balanced ration with locally available ingredients will be encouraged.
- Physical availability and production potential of pastures and grazing community lands will be assessed and steps will be taken to rejuvenate such lands by planting fodder trees and grasses.
- Integrated land use planning with livestock as a component will be encouraged through Panchayati Raj Institutions.
- State government and state agriculture/ veterinary university feed analytical labs would be strengthened.

Animal Health

- **Veterinary Services:** Veterinary hospitals, dispensaries, Sub-centers, diagnostic laboratories and veterinary manpower would be improved and expanded and will continue to be provided as state owned facilities. Private investment to improve delivery of animal health services including facilities by private veterinary graduates would be encouraged.
- **Control and Eradication of Infectious Diseases:** Prevention and control of infectious diseases, being a community welfare activity, would be gradually expanded by involving NGOs, cooperatives and private veterinary practitioners.
- **Disease-Free Zones:** Efforts will be made to make the State free from economically important infectious diseases.
- **Disease Diagnosis:** Facilities for specific and general disease diagnosis shall be strengthened by introducing quality management system.
- **Disease surveillance and forecasting:** Integrated surveillance, vigilance, prevention and control mechanisms would be carried out.
- **Control of Zoonoses:** Special emphasis will be laid to create awareness for control of zoonotic diseases and veterinary drug abuse to protect human health. "One-Health" concept will be strengthened through linkages with other concerned departments, such as Department of Health and Family Welfare.

- **Animal Biosecurity:** States would promote responsible use of antibiotics and other medicines harmful to the environment.
- **Disaster Management:** Contingency plans will be prepared and executed to maintain the productivity and welfare of livestock during various types of natural calamities and drought conditions.
- **Animal Welfare:** Compliance of existing laws of the land on animal welfare will be ensured at every stage of value chain including production, transportation, slaughter, care of draught animal and animal handling.

Meat Production and Processing

- Creation of necessary infrastructure for meat production facilities in rural areas.
- Integrated modern abattoirs construction would be encouraged.

Quality Control and Food Safety

- Production of organic livestock foods will be encouraged through traceability of methods of feeding, treatment and quality production.
- Standardization of processes of production and certification of organic farming processes would be established.
- Awareness generation among farmers and consumers regarding food safety standards would be promoted.

Institutional Credit and Livestock Insurance

- Small holders/farmers would be encouraged/ supported to organize as Self Help Groups or Joint Liability Groups to facilitate access to credit.
- Public Private Partnership initiatives to take up such activities in clusters with linkage for institutional finance and marketing would be supported.
- Protection against the risks due to natural calamities and disease outbreaks etc.
- Livestock insurance would be revamped and made accessible to all farmers.

Conservation of Camels

- Effective measures for improving desert specific draft power, milk traits, disease resistance and sports traits in Camels would be undertaken.
- Special programmes shall be launched for conservation and propagation of camels.
- Production, procurement and marketing of Camel milk shall be promoted.

Goshala Development

- Framing Incentive based Goshala development policies.
- Goshalas would be encouraged to develop as economically self-reliant units through adoption of modern farming and management practices including utilization of principle of Panchgavya as source of income.

Livestock and Environment

- Modify the management and feeding systems so as to reduce emission of green house gases by ruminants.
- Better management of farm yard manure through composting and bio-gas plants.
- Awareness building on improved practices of livestock, feed and waste management.

Information System and Human Resources

- Identify existing data gaps and generate data for proper planning & implementation. Analyse data to correlate and assess the impact of various program.
- **Human Resource:** Developing skills of veterinary professionals and farmer beneficiaries. Optimal human resource planning.

20th Livestock Census 2019

The Department of Animal Husbandry & Dairying under Ministry of Fisheries, Animal Husbandry & Dairying attributes critical importance to livestock and to the collection and availability of up-to-date and accurate data related to livestock, as they are the vital component of rural economy. 20th Livestock Census of Rajasthan was conducted as part of 20th Livestock Census of India. This post lists summary as per the provisional data released by the department.

Animal Husbandry is a major economic activity of the rural peoples, specially in the arid and semi-arid regions of the Rajasthan. Development of livestock sector has a significant beneficial impact in generating employment and reducing poverty in rural areas.

What is Livestock Census ?

The Livestock Census is the main source of such data in the country. The livestock census is conducted across the country periodically since 1919. The census usually covers all domesticated animals and head counts of these animals are taken. So far, 19 Livestock Censuses were conducted in participation with State Governments and UT Administrations. The last Livestock Census was conducted in 2012 as 19th Livestock Census - Statistics

The 20th Livestock Census was launched during the month of October 2018. The enumeration was done in both rural and urban areas. Various species of animals (cattle, buffalo, mithun, yak, sheep, goat, pig, horse, pony, mule, donkey, camel, dog, rabbit and elephant)/poultry birds (fowl, duck and other poultry birds) possessed by the households, household enterprises/ non-household enterprises were counted at that site. Another important feature of 20th Livestock Census is it has been designed to capture Breed-wise number of animals and poultry birds.

Summary of Livestock Population in Rajasthan

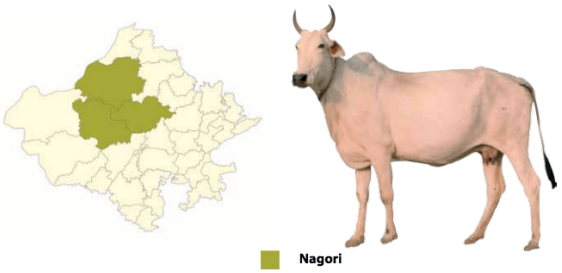
S.NO	Variety	State Rank in India	Population (In Millions) 2019
1	Livestock	2	56.8
2	Poultry	17	14.6
3	Cattle	6	13.9
4	Buffalo	2	13.7
5	Sheep	4	7.9
6	Goat	1	20.84
7	Pig		
8	Camel	1	0.213
9	Horses & Ponies	3	0.034
10	Mules		0.001
11	Donkeys	1	0.23
12	Mihtun	-	0
13	Yak	-	0

Cattle Breeds in Rajasthan

Breeds of Cows in Rajasthan:

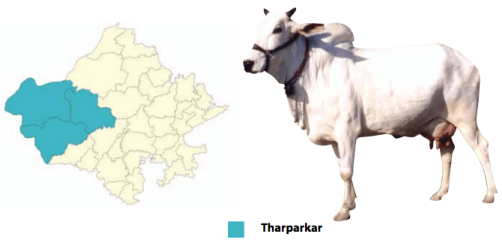
Rajasthan state has three native cattle breeds viz Rathi, Tharparker and Nagori, having great deal of endurance.

Nagauri



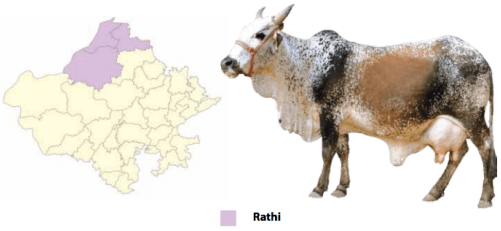
- Origin from Suhalak area Nagaur. Hence, mostly found in Nagaur district.
- Colour: White, light Grey.
- This species gives less milk.
- Type: Draught
- Used for ploughing, cultivation, drawing water from wells as well as transportation of field produce to markets.

Tharparkar Breed



- Originated in Tharparkar district (Pakistan) of undivided India and found mostly in Jodhpur and Jaisalmer districts.
- Origin of the breed: Malani (Barmer)
- Also known as White Sindhi, Gray Sindhi and Thari.
- Cows excellent production of milk.
- Reared for dual purpose of draught and milk production as it can produce milk under rigorous feeding and unfavourable environmental conditions.

Rathi Breed

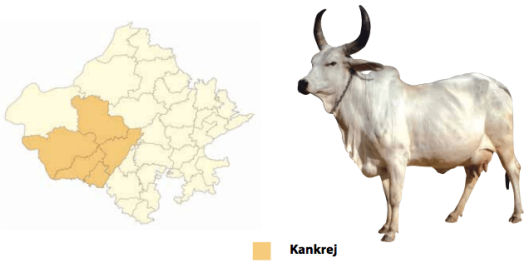


- Mostly found in Loonkaransar Tehsil of Bikaner and Ganganagar, Hanumangarh and parts of Jaisalmer districts.

- Essentially a Milch variety that is cows are good at milk production but males lack draught power.

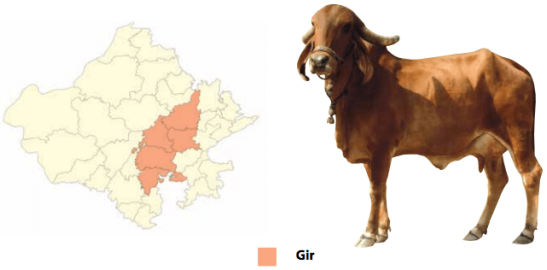
Kankrej

- Kankrej is found in Rajasthan's southwestern districts of Barmer, Sirohi & Jalore.
- Also called as Wadad or Waged, Wadhiar.
- Gives daily average of 5-10 litres of milk.
- The bull of this variety has good draught capacity.



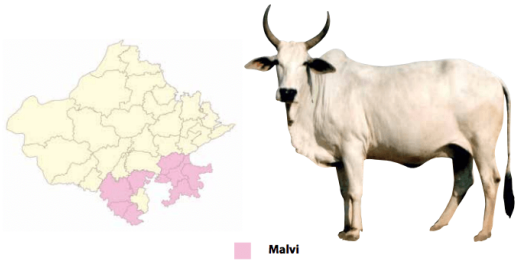
Gir Breed

- Gir breed comes from Gir forests of Saurashtra in Gujarat.
- In Rajasthan it is found in Southeastern Ajmer, Chittorgarh, Bundi, Kota.



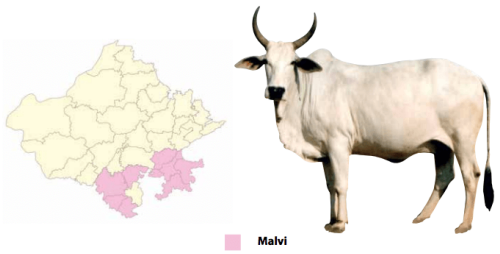
Malvi Breed of Cow

- Mostly found in Malva area of Madhya Pradesh and jhalawar districts of Rajasthan.
- Type : Draught
- Colour : White
- Males: Grey dark



Hariana

- It was originated from Rohtak, Hisar, Jind and Gurgaon districts of Haryana and also popular in Punjab, UP and parts of MP.
- Horns are small.
- The bullocks are powerful work animals.

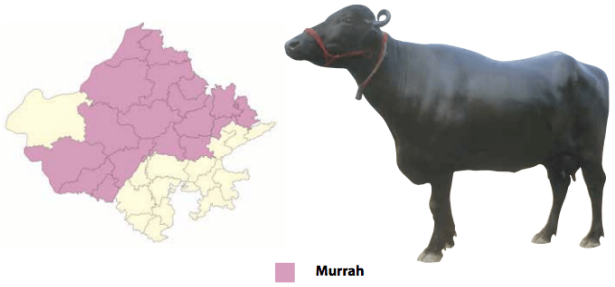


Buffalo Breeds found in Rajasthan

In case of buffalo, there is no native breed. However, enormous number of Murrah, Surti buffaloes are reared in the region.

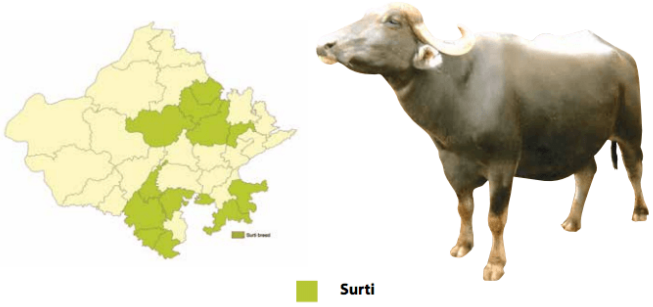
Murrah

- Also called as Delhi, Kundi and Kali.



Surti

- Also known as Deccani, Gujarati, Talabda, Charator and Nadiadi.



Sheep in Rajasthan

Sheep husbandry has traditionally been one of, the most viable elements of the agro-economic system of the State of Rajasthan. The state earns annually remarkable revenue from wool, mutton and other products from Sheep in Rajasthan. Cost effective economy and less expensive housing make the sheep economically viable proposition for the poor people. The size of flock varies from 30 to 50, to as high as 400 sheep.

Major Challenges

- Development/Use of synthetic fiber in manufacturing of apparel and carpet wool.
- Shrinkage of pastureland.
- Poor exploitation of genetic potential of indigenous animals,
- Low absorption of available technology,
- Insufficient health cover,
- Inadequate marketing & credit support.
- Quality of Sheep.

Number of Sheep in Rajasthan

The 20th Livestock Census of India estimates the total number of sheep in country at 74.26 Million during 2019. **Rajasthan, ranks at number 4 position** in India in terms of number of sheep with an estimated population of 7.9 Million. The census 2019 estimates that there has been an decrease of 12.95% in their numbers from 2012 census (9.1 Million).

Draft Rajasthan State Livestock and Dairy Development Policy, 2019

The draft Rajasthan State Livestock and Dairy Development Policy, 2019 outlines following guidelines for development of Meat & Wool sector in state:

- Emphasis on small ruminants would be to improve nutrition and genetics, breeding strategies and health cover to increase proliferacy, carcass weight gain and reduced mortality to improve quality and quantity of meat, skin and wool.

- Selection of breeding stocks through large scale screening involving farmer's flocks would be taken as a state program. The farmers would be encouraged to be organized as cooperatives or FPOs for better access to inputs and market gains.

Sheep Migration in Rajasthan

Migration of sheep is a regular feature of sheep rearing in the western parts of Rajasthan.

- Sheep from southern parts of Jodhpur-Jaisalmer pass through Bali, Abu-road through Palanpur, reach up to river beds in Baroda, and Surat where they spend about two months.
- Similarly sheep from northern parts of these regions go through Sawai-Madhopur or Hindaun city to river bank in Mathura.
- Usually, the farmers set out on their journey in winter and return to their homes in early monsoon.
- In Churu, Jhunjhunu and Sikar districts the flocks are relatively stable and they migrate for short period from their home village to grazing areas in neighbouring villages when the local pastures are exhausted.

Breeds of Sheep in Rajasthan:

- Jaisalmeri
    - Found in Jaisalmer
- Naali
    - Found in Hanumangarh, Churu, Bikaner & Jhunjhunu.
    - Yields large quantity of wool
- Maalpuri
    - Found in Jaipur, Dausa, Tonk, karauli & Sawai madhopur
- Magra
    - Gives approximately 2 Kg of Wool per year
    - Found in Jaisalmer, Bikaner, Churu, Nagaur

- Pugal
    - Originated from Pugal in Bikaner
- Chokla or Shekhawati
    - Also referred to as Marino of India
    - It yields best quality wool and gives around 1-1.5 Kg per year.
- Sonari or Chanothar
    - Sonadi are distributed in Udaipur and Kota division and are common in sub-humid and humid areas.
    - They with-stand heavy rainfall conditions and extend into Gujarat state to the south
- Marwari
    - Marwari are found all over Jodhpur, Jaipur and parts of Ajmer division

Breed	Home Tract (Districts)	Av. Wool Prod'n. [Kg./ Yr.]	Type of Wool
Chokla	Sikar, Churu, Jhunjhunu , Nagur (Part)	1.36– 2.27	Fine & Medium
Magra	Bikaner,Jaisalmer (part)	1.3 – 2.2	Coarse & Medium
Nali	Sriganganagar, Hanumangarh	1.3 – 2.7	Coarse & Medium
Pugal	Bikaner (Part)	1.36–2.26	Coarse & Medium
Marwari	Jodhpur, Pali, Nagaur	0.9 – 1.8	Coarse & Medium
Malpura	Tonk, Jaipur	0.6 – 1.3	Coarse & Medium
Sonadi	Udaipur	0.9 – 1.36	Coarse & Medium
Jaisalmeri	Jaisalmer, Barmer	1.8 – 3.1	Coarse & Medium

Government Initiatives to develop Sheep in Rajasthan

Sheep Breeding Programme

- To improve the sheep population of the state genetically by providing superior breeding males (rams) to the sheep breeders, Rajasthan Animal Husbandry Department is running a Sheep Breeding Farm at Fatehpur (Sikar).
- According to the departmental sheep breeding policy, the indigenous pure breed Ram (Chokala, Nali and Marwari) of the farm has been distributed to sheep breeders @ Rs. 50/- per Kg live weight. In the year 2018-19, the farm has distributed 243 proven Rams at subsidized cost to sheep breeders.

The Integrated Wool Development Programme (IWDP)

- The Integrated Wool Development Programme (IWDP) is an umbrella programme which will be implemented over three years i.e. from 2017-18 to 2019-20 in all wool producing states.

Organisations:

ICAR-CSWRI

- The Central Sheep and Wool Research Institute (CSWRI) is a premier Institute of Indian Council of Agricultural Research (ICAR) engaged in research and extension activities on sheep. It was established in 1962 at Malpura in Rajasthan. Now campus is popular by the name of Avikanagar in Tonk district.

ICAR - CAZRI

- The Central Arid Zone Research Institute (CAZRI) was established in 1959 under Indian Council of Agricultural Research (ICAR), New Delhi. C.A.Z.R.I has been involved in sheep research, both under farm and rangeland conditions.

Central Wool Development Board, Ministry of Textiles

Operates:

- The Wool Testing Laboratories (Pre loom) at Bikaner & Beawar.

- The Industrial Service Centre (Post Loom testing facilities) at Bikaner. Raw wool Scouring facilities at Beawer.
- Computer Aided Designing Centre (CAD) for carpet at Jaipur
- Wool Scouring and Drying Plant at Beawar

Animal Husbandry Department, GOR

- The Animal Husbandry Department thus came in to existence in 1958 along with Sheep and Wool and Fisheries sections. In 1984 the Fisheries Department was separated from the Department of Animal Husbandry making it an independent Department.

Rajasthan Livestock Development Board

- Rajasthan Livestock development Board was setup by state government on 25.03.1998 under the Rajasthan Societies Act 1958.

Camels of Rajasthan

Camel is the iconic animal of Rajasthan. It is part of the cultural identity & life of the desert state. In 2014, Camels (*Camelus dromedaries*) have been declared as the State Animal (Livestock) of Rajasthan supporting about 85 per cent of India's camel population. The other major states with a sizeable camel population include Gujarat, Haryana and Uttar Pradesh.

The identity of Rajasthan, the ship of desert is now fighting for survival. As per Times of India (Nov, 2019), *the number of camels arrived for sale at the Pushkar fair is lowest in the last 20 years. The fair is globally projected as the International Camel Fair or world largest camel fair by travel portals. However, there are now projections that in the next five years, camels will disappear from the fair*.

The 20th Livestock Census of 2019, has estimated their number at 3223, a drop of 37% percent since 2012 and 75% since 1992.

Act for Protection of Camels:

- The Rajasthan Camel (Prohibition of Slaughter and Regulation of Temporary Migration or Export) Act, 2015

Breeds of Camel in Rajasthan:

- Bikaneri
    - Found in Bikaner, Gangangar, Hanumangarh & Churu
- Jodhpuri
    - Found mostly in Jodhpur & Nagaur districts
- Nachna:
    - This breed is fast-runner variety of camels
    - Origin from Nachna Village in Jaisalmer
- Jaisalmeri
    - Camels of Jaisalmeri breed are found in Jaisalmer, barmer, and jodhpur
- Kutchi

- Camels of this variety are mainly found in Barmer & Jalore

- Jalori
  - Camels of this variety are mainly found in Jalore & Sirohi
- Mewari
  - This breed is extensively used for carrying loads
  - Camels of this variety are mainly found in Udaipur, Chittorgarh, Partapgarh & Ajmer
- Gomat
  - This breed to camel is famous for distant-transport and it is also a very fast runner
  - Camels of this variety are mainly found in Jofhpur and Nagaur
- Gurha
  - Found in Nagaur & Churu
- Kherupal
  - Found in Bikaner & Churu
- Alwari
  - Camels of this breed are mostly found in East-Rajasthan.

Decline in Camel Population

About 85 per cent of India's camel population survives in Rajasthan. The other major states with a sizeable camel population include Gujarat, Haryana and Uttar Pradesh. Given the current scenario, the camel (*Camelus dromedaries*), the State Animal of Rajasthan, may soon figure in the IUCN Red List as a critically endangered species.

In the 20th Livestock Census, the camel population in the state has dipped by 71 per cent since the 1990s. The latest census indicates 213,000 camels in Rajasthan, down from 746,000 in 1992. Overall, the camel population in India dipped by almost 37 per cent since 2011 and 75 per cent since 1992.

Reasons for decline of Camel Population:

- Mechanisation:
  - The camel was an important draught animal in the state, but slowly, mechanisation overtook it.
- Smuggling:
  - Camel trading is common in Bengal, Bihar and UP. Animals taken from Rajasthan are sold in the markets of Itahar, Chanchal, Harishchandrapur, Ratua in West Bengal and some other areas.
  - There is a huge demand for camel meat in Bangladesh as well.
- Proliferation of diseases
  - The most commonly found disease in camels, trypanosomiasis, which leads to still birth and dystokia.
  - Other reasons for the dwindling camel population are rampant morbidity and mortality.
- Distorted male-female ratio of camels.
- Ecosystem disruptions along with climate change - decrease in grazing and pasture land.
- Lack of pastures and grazing land for these animals.
- Policy failure:
  - The State enacted the Rajasthan Camel (Prohibition of Slaughter and Regulation of Temporary Migration or Export) Act. This act banned selling or transporting of these camels outside the state. This has left the animal without a market outside the state.

Steps taken by Rajasthan government:

- Declaration of Camel as *State animal of Rajasthan*.
- The *Rajasthan Camel (Prohibition of Slaughter and Regulation of Temporary Migration or Export) Act, 2015* to prevent illegal smuggling & trading of camels. As per the act, illegal transportation of camels, without the permission from a competent authority, is a punishable crime with rigorous imprisonment of between six months and three years and attracts a fine of Rs 5,000 to 25,000.
- A dedicated *National Research Centre on Camel (NRCC),* has been started in Jorbeer, Bikaner.
- On 2 October 2016, the Rajasthan state government announced *Ushtra Vikas Yojana*, an innovative new Camel Development Scheme. Government of Rajasthan will support camel breeders with a subsidy of INR 10,000 (payable over a period of eighteen months) for each camel calf born, along with other measures which include training centres, improved access to veterinary treatment and research on camel products.

- On 2 December 2016, the Indian government made the long-awaited announcement of *FSSAI standards for camel milk*, resolving an issue which has held back camel dairy development in India for years.

Food Processing Industries in Rajasthan

Rajasthan is India's largest state by area (342,239 square kilometers and 10.4% of India's total area). The state, with its diverse agro-climatic conditions is richly endowed with the cultivation of a variety of crops. Agriculture & allied activities make up for 24% of the State's GDP, with 62% of total working population of the State dependent on this for livelihood. Together, Rajasthan has good scope for food processing Industries.

Major strengths of Rajasthan for food processing industry:

Geography and Climate:

- Rajasthan has a wide range of climate varying from extremely arid to humid.
- The state has 10 agro-climatic zones, suitable for wide variety of cereals, fruits, vegetables and a large number of livestock.

Raw Materials:

- State is largest producer of Psyllium, Cluster bean, Fenugreek, cumin, mustard, pearl millet, moth bean and Coriander.
- Rajasthan has 10% of the total livestock in India and is the second largest producer of milk in India.

Agricultural Marketing:

- 141 main market yards and 315 sub market yards, 4 big pack houses, 5 small pack houses and 7 cold storages are in operation and one walk-in cooling chamber at Jaipur Airport. 8 AGMARK (a certification mark embossed on agricultural products in India) laboratories for grading of the produce.

Marketing Reforms:

Marketing Reforms in Rajasthan to ease procurement of raw materials:

- Contract Farming: Allow contract farming for fruits, vegetables, medicine plants, barley, maize and aromatic plants.
- E-Commerce: Permit the setting up of private sub e-markets.
- Direct Purchase: The state has allowed to remove all restrictions on direct purchase of agriculture and horticulture products produced in the State by the agro-processing enterprises
- Market Fee: The market fee on fruits and vegetables has been exempted and trade outside yard is free.
- Private Market Yard: Private sector can establish market yards to enhance supplies to industries.

Supporting Infrastructure:

- State has 6 Inland Container Depots
- 2 Agri Export Zones - 1 for Coriander covering Kota, Bundi, Baran, Jhalawar & Chittorgarh and 1 for Cumin covering Nagaur, Barmer, Jalore, Pali and Jodhpur
- Out of 344 Existing Industrial Areas, (as per RIICO -Rajasthan State Industrial Development and Investment Corp), there are 26 Industrial areas marked suitable for food processing industry.
- There are 6 food parks in Rajasthan. One Mega Food Park in Ajmer and five other in, Alwar, Kota, Jodhpur and Sri Ganganagar.

Policy Support:

- The state has released "Rajasthan Agro-Processing and Agri-Marketing Promotion Policy – 2015".
- Food Processing sector has been accorded the status of a Thrust Sector under the Rajasthan Investment Promotion Scheme, 2014 (RIPS 2014).
- 5% Interest Subsidy for 5 years for various categories food processing enterprises

Food Processing Industry in Rajasthan

- About 10,000 units are operational in the micro and small scale sector and approximately 75 units in the medium and large scale sector. Rajasthan has several districts known for processing. However, Most of the raw material produced in Rajasthan are processed outside the state.

Important Food Processing Companies in Rajasthan

- Lotus Dairy - Bikaner, Sikar, Jaipur, Shri Ganganagar
- Paayas Dairy - Jaipur
- Adani Wilmart Pvt. Ltd. - Bundi
- Advantage Overseas Pvt. Ltd. - Bundi
- Mahesh Edible Agro oil India Pvt. Ltd. - Kota, Alwar
- Goyal Protein Ltd. - Kota
- Otekar India Pvt. Ltd - Alwar
- Barmalt Malting Ltd. – Alwar

Food Processing Clusters in Rajasthan

Spices and Condiments Processing	Kota, Jodhpur, Bikaner, Jaipur
Milk Processing	Alwar, Jaipur, Ajmer, Bikaner
Pulses Processing	Jodhpur, Bikaner, Jaipur
Snacks Processing	Bikaner, Jaipur
Mustard & Soybean Processing	Kota , Bundi
Barley Processing	Jaipur, Sikar, Dausa, Tonk, Bundi
Maize Processing	Bhilwara, Chittorgarh, Banswara
Prepared Foods	Alwar, Jaipur , Ajmer
Wheat Processing	Jaipur, Alwar, Shri Ganganagar, Hanumangarh, Kota, Bundi,

	Baran
Oil Processing	Alwar, Ganganagar, Bharatpur, Bundi, Kota
Fruits & Vegetable Processing	Sikar, Ajmer, Banswara, Chittorgarh

Rajasthan Horticulture Outlook

Agriculture and allied sector is the backbone of the State's economy and contributes around *24% to the GSDP*. Nearly 75% of the population on of the State resides in the rural areas and about 62% depends on agriculture and allied activities for their livelihood.

Rajasthan is also a key state in terms of production of horticultural produce, particularly *spices, medicinal and aromatic plants*. The State contributes around 10% to India's total spices and 15% to Medicinal and Aromatic Plants production. As per the annual estimates of GoI for 2015-16, the state produced around:

- 6.82 lakh MT of fruits,
- 19.87 lakh MT of vegetables,
- 0.06 lakh MT of flowers,
- 10.56 lakh MT of spices and
- 1.87 lakh MT of medicinal and aromatic plants.

The state is one of the leading producers of Coriander, Cumin, Fennel, Fenugreek, Ajwain, Garlic, Dilseed, Psyllium Husk and Henna.

Area, Production and Productivity of Key Horticulture Categories in Rajasthan

Sr. No.	Category	Rajasthan - Area ('000 Ha.)	% of National Area	Rajasthan - Production ('000 MT)	% of National Production	Rajasthan – Productivity (MT/ha)	India – Productivity (MT/ha)
1	Fruits	43	1%	682	1%	16	14
2	Vegetables	191	1.9%	1987	1.2%	10	17
3	Spices	1015	29%	1056	15%	1	2
4	Medicinal & Aromatic Plants	369	58%	187	18%	1	2

Source: NHB- Third advance estimates 2015-16

Key Horticulture Products of Rajasthan

Produce	Key producing area/district	Key Mandis
FRUITS AND VEGETABLES		
Potato	Bharatpur, Dholpur	Bharatpur, Dholpur, Jaipur
Tomato	Jaipur, Sirohi, Ajmer, S. Madhopur, Tonk	Jaipur, Chomu, Bassi, Reodar
Onion	Sikar, Jaipur, Jhunjunu, Nagaur, Jodhpur, Alwar	Sikar, Jaipur, Chomu, Phalodi, Alwar, Khairtal
Orange	Jhalawar	Bhawani mandi, Jhalrapatan
Pomegranate	Jalore, Barmer, Chittorgarh, Bhilwara, Sri Ganganagar, Jodhpur, Jaisalmer	Jaipur, Jodhpur
Guava	Sawai Madhopur, Kota, Bundi, Bharatpur	Sawai Madhopur, Jaipur
Kinnow	Sri Ganganagar, Hanumangarh	Sri Ganganagar
Date Palm	Bikaner, Jaisalmer	-
SPICES		
Garlic	Jhalawar, Baran, Kota, Pratapgarh, Chittorgarh	Chhipa Barod, Jodhpur, Kota
Cumin	Barmer, Jalore, Jaisalmer, Jodhpur, Nagaur, Pali	Jodhpur, Merta, Nagaur, Phalodi, Barmer
Coriander	Baran, Bundi, Chittorgarh, Jhalawar, Kota	Ramganj mandi, Kota, Baran
Fenugreek	Chittorgarh, Jaipur, Jhalawar, Kota, Nagaur, Sikar, Churu, Bikaner, Jhunjhunu, Jodhpur	Kota, Jaipur
Ajwain	Chittorgarh, Udaipur, Bhilwara, Rajsamand	Bhilwara, Jaipur
Fennel	Nagaur, Jodhpur, Pali, Tonk	Lalsot, Newai
OTHERS		
Isabgol (Psyllium Husk)	Barmer, Jalore, Nagaur, Jaisalmer, Jodhpur, Chittorgarh	
Henna (Mehndi)	Pali, Jodhpur	

Horticulture Infrastructure of Rajasthan

Horticulture related Research Institutes in Rajasthan

- Ajmer:
    - Adaptive Trial Centres, Tabiji Reasearch Institute
- Alwar:
    - Agriculture Research Station, Navgaun
- Bharatpur:
    - National Rapeseed & Mustard Research Institute
    - Adaptive Trial Centres, Malikpur
- Bikaner:
    - Agriculture Research Station, Beechwal
    - Adaptive Trial Centres, Loonkaran
- Bundi:
    - Adaptive Trial Centres, Chattarpura
- Chittaurgarh:
    - Adaptive Trial Centres, Chittorgarh
- Jaipur:
    - Agriculture Research Station, Durgapura
- Jalore:
    - Agriculture Research Station, Keshwana
- Jodhpur:
    - Central Arid Zone Research Institute
    - Arid Forest Research Institute
    - Agriculture Research Station, Mandore
    - Adaptive Trial Centres, Rampura

- Kota:
    - Agriculture Research Station, Ummedganj
- Pali:
    - Adaptive Trial Centres, Sumerpur
- Sikar:
    - Agriculture Research Station, Fatehpur
- Sriganganagar:
    - Agriculture Research Station, Ganganagar
    - Adaptive Trial Centres, Shri Karanpur
- Tonk:
    - Central Sheep & Wool Research Institute
- Udaipur:
    - Agriculture Research Station, Udaipur

Centers of Excellence:

- Six Centers of Excellences on Citrus, Mango, Orange, Guava, Datepalm and Pomegranate have been established in the state.

Fisheries

As per National Fisheries Development Board (NFDB), India is world's third largest fish producer. In aquaculture, India is second only to China, with a 7% share in global production. Fish production also contributes around 1% to India's gross domestic product and over 5% to the agricultural GDP. In Rajasthan, besides providing fish production, the sector also provides low cost food rich in protein & employment to rural and weaker sections.

Fisheries Resource in Rajasthan:

In water resources Rajasthan state stands on 11 position in the country. Rajasthan has good aquatic resources to become a leading fish producer in the country, water resources in Rajasthan include:

- 3.29 lakh hectare - large and medium water bodies
- 0.94 lakh hectare - small water bodies and ponds
- 0.87 lakh hectare - rivers and canals

As per the study conducted by the Central Institute of Fisheries Education, Mumbai (2010) the fish production potential of Rajasthan is more than 80,000 metric tonnes annually.

Fish Production in Rajasthan

The fish production potential of Rajasthan is more than 80,000 metric tonnes annually while production achieved in the State in the year 2020-21 is only 34,832.11 metric tonnes upto December, 2020.

Hence, there is good scope for further development of fisheries sector in the State.

Government Departments:

Union Level:

- Department of Fisheries - Ministry of Fisheries, Animal Husbandry and Dairying [New Ministry formed in **May 2019**]
- National Fisheries Development Board (NFDB)

Rajasthan Government:

- Department of Fisheries

Schemes Related to Fisheries in Rajasthan

The Department has started implementation of ambitious scheme on 'livelihood model', which is a 'zero revenue' model, for the upliftment of tribal fishermen in three reservoirs namely, Jaisamand Udaipur), Mahi Bajaj Sagar (Banswara) and Kadana Backwater (Dungarpur). As per the new model the lift contract has been given to the highest bidder.

National Mission for Protein Supplement

- Under National Mission for Protein Supplement scheme, a cage culture project has been sanctioned by Government of India at a cost of `3.44 crore for the dissemination and demonstration of modern fisheries-techniques at Mahi Bajaj Sagar (Banswara) and 56 cages have already been installed there.
- Two phases have been completed by the department and for the third phase the cages has been allotted to tribal fishermen society Bassipada (Banswara) to take up fish culture.
- `3.64 crore has been sanctioned for Ornamental Fish breeding unit and aquarium gallery and it is under construction as an innovative work at Bisalpur Dam (Tonk).
- A new area of sport fisheries is being developed at Bisalpur Dam (Tonk) by the department. Mahaseer fish and cat fishes are generally used for sport fisheries. In this Project, 0.45 lakh Mahseer fish seed (Sport fish) has been procured from Lonawala (Maharashtra) and stocked in Bisalpur Dam.

Rashtriya Krishi Vikas Yojana (RKVY)

- Under Rashtriya Krishi Vikas Yojana (RKVY), an amount of `15.30 crore has been approved for the modernization/ construction of 41 fish landing centres of Rajasthan to reduce the post-harvest losses.
- The construction of fish landing centres at Ramsagar (Dholpur), Bisalpur (Tonk) and Rana Pratap Sager (Rawatbhata), Jawai dam (Pali) & Jaisamand (Udaipur) have been completed.

The ministry of Agriculture & Farmers Welfare, Government of India has accordingly restructured the schemes by merging all the ongoing schemes under an umbrella of **blue revolution** at the cost of `3,000 crore. It will ensure achievement of food & nutritional security in a sustainable manner keeping in view the bio security and environmental concerns.

Forestry

Forestry is the pivot of ecological and environmental balance and plays a significant role in the state's economy.

Panchayati Raj Institutions (PRI) have been empowered to get income from the collection of minor forest produce from forest as well as non-forest areas. Planting activities on non-forest land also vests with PRIs.

Under Joint Forest Management Programme, 6,022 Village Forest Protection and Management committees (VFPMC) are protecting and managing 11.84 lakh hectare of forest land under the guidance of the department.

Out of these 6,022 Committees 682 **Eco- Development Committees** around sanctuaries and national parks have been constituted to get participation of local people in wildlife management.

Crop Diversification

Crop diversification is intended to give a wider choice in the production of a variety of crops in a given area so as to expand production related activities on various crops and also to lessen risk. Crop diversification in India is generally viewed as a shift from traditionally grown less remunerative crops to more remunerative crops. The crop shift (diversification) also takes place due to governmental policies and thrust on some crops over a given time, for example creation of the Technology Mission on Oilseeds (TMO) to give thrust on oilseeds production as a national need for the country's requirement for less dependency on imports.

Rajasthan is promoting crop diversification as a way of shielding farmers against the vagaries of nature. The farmers have made use of the soil health cards issued to them for selecting crop patterns on the basis of productivity of land and the local agro-climatic conditions. With low land productivity and increasing use of pesticides in agriculture adversely affecting nutrients in the foodgrains, farmers are also taking up horticulture, dairy farming, pisciculture and food processing to augment their income.

Government Initiatives:

The Government has been instrumental in exploring different crops that can grow in climatic conditions of Rajasthan but have higher demand and potential to improve farmers income. These include:

Olive cultivation

State Horticulture Department of Rajasthan government had initiated the olive cultivation project with *technical support from Israel* in 2008. Seeing the ample possibilities, the state government formed the *Rajasthan Olive Cultivation Ltd (ROCL)* in the public-private-partnership (PPP) mode. ROCL was incorporated on 19.4.2007 under the Company Act, 1956.

Olive cultivation in Rajasthan is at present spread over 800 hectares, of which 182 hectares is being undertaken by ROCL on Government farms in different agro-climatic regions of the state in districts of Sri Ganganagar, nagaur, Bikaner, Jalore, Jhunjhunu, Alwar, Jaipur.

Initially, seven varieties of olive -- Arbequina, Barnea, Coratina, Picholine, Picual, Koroneiki and Frantoio -- were imported from Israel and planted at these eight locations.

Rajasthan government, with Israel's help, has set up a centre of excellence at Jaipur's Bassi area to provide high-quality plants to the farmers. Additionally, the state government also provides subsidies on plant saplings, fertilizer and drip-irrigation systems.

The Indian state of Rajasthan is set to launch its own brand of olive oil under the name "Raj Olive Oil," the first Indian olive oil produced within the country.

Olives in Rajasthan

- Olive oil refinery: Lunkaransar, Bikaner
- Olive Green Tea production: Bassi, Jaipur

Dragon fruit farming in Rajasthan

Rajasthan State government is trying to integrate traditional agriculture with allied forms of farming. Fruit cultivation is a major focus area and the government aims to double area under fruit cultivation in the next five years. Working on the line, researchers at the *Centre of Excellence for Agriculture (CoEA) in Jaipur* hope to start transfer of dragon fruit saplings by this fiscal-end to farmers.

Dragon fruit or Pitaya is native to Mexico and grown extensively in South-East Asian countries like Thailand, Malaysia, Vietnam and Cambodia. Now, this fruit will be grown on an experimental basis at the agriculture department's centre of excellence at Bassi and at Deorawas near Tonk and if the project is successful, it will be replicated in districts of western Rajasthan

Rajasthan has started cultivation of three varieties Cassia tora (medicinal plant), Dragon Fruit (Pitaya), and Pistachio (pista). While, Dragon Fruit would be cultivated in 5,000 sqm in Rajasthan, steps have also been taken for cultivation of pista. India was importing pista (pistachios) from foreign nations, but state has better climate in Hanumangarh and Sriganganagar district for cultivation of pista.

Date palm farming in Rajasthan

Rajasthan government aspires to double farmers income by 2022 through new initiatives like organic farming and cultivation of horticulture crops like Olives, Citrus fruits and Date Palm. With agriculture in the state being primarily rain-fed, especially in the arid Western and Northern regions, the Rajasthan government has been encouraging farmers to cultivate exotic plant species like olive, jojoba, dragon fruit and date palms that need comparatively less water and have potential to make cultivation profitable.

In 2007-08, the state government had started date palm cultivation on a trial basis in 135 hectares of its own farmland in Jaisalmer and Bikaner and had imported around 21,000 tissue culture raised saplings from the UAE. Later in 2008-09, Rajasthan government started promoting date palm farming on farmers' land in 12 districts -- Jaisalmer, Barmer, Jodhpur, Bikaner, Hanumangarh, Sri Ganganagar, Nagaur, Pali, Jalore, Jhunjhunu, Sirohi and Churu. Farmers have planted date palm crop in 813 hectares.

Date palms take 4 to 8 years after planting before they bear fruit. Yields improve as trees grow older and the tree has a lifespan of 15 years with maximum fruits from 10th year onwards.

The first harvests for date palms have started in Rajasthan and the state is expecting an output of around 800 Tonnes. The state grows date palm varieties like Barhee, Khuneji, Khalas, Medjool, Khadravi, Jamli and Sagai.

Rajasthan Government Support for Date Palm Cultivation:

- The state government is promoting date palm farming in arid desert regions of north-western Rajasthan and giving tissue culture raised sapling to farmers at a subsidised rate under the centrally-sponsored scheme Rashtriya Krishi Vikas Yojana (RKVY).
- The state government has also tied up with a private company Atul Ltd for cultivating fine quality tissue cultured date palm saplings for distribution to farmers at a subsided rate.
- A single sapling of date palm costs Rs 2,000- 2,500 but Rajasthan Government is giving subsidy up to 75 per cent provided farmers use drip irrigation.
- The agriculture sector working on Indo-Israeli collaboration, started the date research at Sagra-Bhojka farm and after its success, efforts are being made to start a *centre of excellence* to develop date using Israeli techniques.
- In State Budget 2020-21, it has been announced to increase area under Date farming to 1500 hectare area in next 4 years

Custard Apple - New variety

Despite its semi-arid conditions, Rajasthan is the *sixth largest producer of citrus fruits,* fourth largest producer of orange and eighth largest producer of pomegranate in India, according to Rajasthan Horticulture Board (RHB). Now, a new variety of *custard apple (Sitaphal)*, bigger in size than the ones

present in Rajasthan, is being studied by the agriculture department for cultivating it on a bigger scale in the desert state.

Custard apple, a rich source of *vitamin C and an anti-oxidant*, is widely grown in the tribal belt of Rajasthan which includes Udaipur, Chittorgarh, Dungarpur, Banswara, Rajsamand and Jhalawar.

The sample samplings for new variety, *known as Saraswati Sevan*, have been received from Nagpur, Maharashtra and will be grown in Nanta area of Kota district. Rajasthan is also coming up with a *Centre of Excellence for custard apple* in Chittorgarh.

Orange Cultivation in Rajasthan

In India, Rajasthan occupies Sixth place in production of orange. The main variety of Oranges cultivated in Rajasthan is '*Mandarin or Nagpur orange*' with Kota division is contributing 98% of the State produce of this variety. The suitable rainfall and climatic condition allows higher productivity and Jhalawar in Kota region is known as "*Nagpur of Rajasthan*".

Rajasthan Government support for orange cultivation:

- Development of Centre of Excellence (CoE) for Citrus Fruits at Nanta near Kota.
- Development of 24 varieties including Clementine, Michale Daisy, Kinnow, Nagpur Mandarin, Nagpur Seedless, and Jaffa among others.
- Introduction of better technology like mulch, drip and ridge bed system for irrigation and promoting mechanization in orchard operations.
- The horticulture department of Rajasthan Government is mulling a project to market orange from the state under the brand, '*Raj Santra*'.

Quinoa

Quinoa, a pseudo cereal, which sells for a premium in the international market, is being promoted in Rajasthan. State Agriculture department in Rajasthan has entered into an agreement with a private company, according to which, two quinoa processing units will be set up in the state (Udaipur & Tonk) and quinoa will be bought back from farmers.

As per official data, quinoa is being cultivated on 3,300 hectares in 11 districts of agriculture divisions including Bikaner, Bhilwara, Jalore and Udaipur by 10,000 farmers. Its production is 60,000 quintals. Quinoa is cultivated in Peru, Bolivia, Ecuador, Australia, China, Canada, England and many other countries.

Other Varieties for Crop Diversification

State government is encouraging farmers to grow **strawberries near Bassi** in Jaipur, alongside promoting protected cultivation of capsicum and cherry tomatoes.

Also, farmers have taken up **cultivation of exotic flowers** like gladiolus, lilium, gerbera, rose and carnations in open fields as well as in the shade. Stevia, a natural alternative to sugar, is now grown in the state.

Agri-Tourism

In a new initiative labelled as *Agri Tourism*, Rajasthan Government is preparing to host tourists on fields to provide a complete hands-on farming experience. The initiative will introduce agriculture tourism in the state, developing both food parks and encouraging farmers to develop their farm fields.

Linking the tourism sector to agriculture has the ability to rejuvenate and inject resources for both sectors. Agri tourism will give tourists an attractive option to witness farming activities and learn more about rural way of life.Visitors will receive direct exposure and taste of rural life with stay on farm fields. For farmers it will be a source to generate additional income.

Brief about Agri Tourism:

Agri tourism is the incorporation of tourism with agriculture. It promotes agriculture and allied activities as a tourism product and incorporates an operational farm along with a commercial tourism element.

The concept of Agri tourism was initiated and developed in Europe and North America and has since spread in many countries. In India it was initiated in *2005 at Malegaon village*, near Baramati, Maharashtra by Agri Tourism Development Company (ATDC).

Activities planned/takenup by Rajasthan Government:

- Agri-tourism is being promoted in *Mega Food Park at Roopnagar in Ajmer*. The park provides facilities for visiting organic farms and learn about different agriculture practices and produce. Government is planning to open up four more facilities. However they will be on public private partnership.
- Government is also considering developing similar visits in orange fields of Jhalawar & Sri Ganganagar, where tourist can see citrus fruits plants, taste them and understand the processing of fruits.
- Other activities like cow milking, cooking food on rural chulha's made of mud, learning basic rural handicrafts also have potential of developing tourism in villages.

The development of agri tourism can not only helped farmers to hedge their risks from normal farming activities and increase revenues, but also improve their lifestyles.

Current Affairs

'Raj Kisan Organic App'

In July 2021, Rajasthan Agriculture Department has launched **'Raj Kisan Organic App' or 'Rajkisan Jaivik'** through one can easily purchase and sale of organic products in the state online. The application has been developed by the Department of Information Technology & Communication, GoR.

Organic Village

Dadiya village in Jaipur is being planned to develop as the first organic village of Rajasthan. The initiatives have been taken under Pradhan mantra adarsh gram yojana & Doubling farmer's income by 2022.

Rajasthan govt to tag cattle to develop e-market

In February 2020, to develop a market for the cattle and increase the income of the cattle herders, Rajasthan animal husbandry department has launched a new scheme to develop an e-market.

Under this scheme, the workers of the department will go door to door, to tag the animals on ear and collect all the information required. The information will contain – breed, past diseases, milk quantity, vaccination and price. After the process is complete, the farmers will be able to sell their animals from the website. The buyers can log on to the website, choose the animal of their choice and can then bid on them. At first, the scheme has been launched in Jaipur district. Later, other regions of the state will be joined.

MoU for State's first biotech park, incubation centre

A Memorandum of Understanding (MoU) will be signed between the Centre's biotechnology department and department of science and technology (DST), government of Rajasthan for development of biotechnology park and biotechnology incubation centre.

Locust Problem in Rajasthan

Locust attack in Rajasthan and Gujarat during 2019-20 is believed to be one of the worst in last 60 years. It has been estimated that locusts have damaged crops across an area of at least 3.6 lakh hectares in 10 districts of Western Rajasthan.

Since May 2019, farmers in western Rajasthan have been badly hit by locust attack. **Locust Warning Organisation (LWO), Jodhpur**, along with the district authorities are working on combating the menace by sprinkling pesticides. After damage to Kharif crop, Rabi crops are under threat of locus attacks. According to LWO, the last major locust attack in Rajasthan was witnessed in 1993.

What are Locusts?

Locusts are a collection of certain species of short-horned grasshoppers that have a swarming phase. These insects are usually solitary, but under certain circumstances they become more abundant and change their behaviour and habits, becoming gregarious.

Locusts have formed plagues since prehistory. The ancient Egyptians carved them on their tombs and the insects are mentioned in the *Iliad*, the Bible and the Quran. Additionally, locusts are considered a delicacy in many African, Middle-Eastern & Asian countries and eaten in abundance. They are excellent source of protein, and have a variety of fatty acids & minerals.

Lifecycle: The life cycle of locust consists of eggs, nymphs and adult. The eggs take about two weeks during favourable conditions to hatch into nymphs. Both nymphs and adults are feeders. However, the nymphs (also known as hoppers) do not have wings and become adults 30-40 days after hatching. The young adults take about three weeks before they are ready to mate and lay eggs. Adults live for three to five months.

Locust Swarm: Locust swarm can fly at speed of more than 15km/hr and cover a distance of more than 100 Km/day. These swarms can be as large as 80 million individuals.

What are Pink Locusts?

Desert locusts have two phases, the solitary phase and the gregarious phase. Their colouring tends to be greenish or brownish to match the colour of the herbage. In the gregarious phase the hoppers bunch together and in the later instars develop a bold colouring with black markings on a yellow background. The immatures are pink and the mature adults are bright yellow and fly during the day in dense swarms.

Where do the Locusts come from?

As per the the Food and Agriculture Organisation (FAO) of the United Nations, in January 2019, the first locust swarms left to Yemen, Saudi Arabia, and south-west Iran, where heavy rains were reported. Between February and June, widespread spring breeding in Yemen, Saudi Arabia and Iran caused the formation of large numbers of locust swarms. These swarms invaded the India-Pakistan border between June and December.

In India, the extended monsoon provided a favourable environment for the locusts to multiply.

Damage due to Locust attack

According to FAO, a swarm of locusts, which contains about 40 million insects and can eat the same amount of food in one day as 35,000 people. Locusts devour leaves, flowers, fruits, seeds, bark, & growing points and can also destroy plant be their sheer weight as they descend on them in large numbers.

Crops of mustard, cumin and wheat have been devastated in the two states, affecting lakhs of farmers. It has been estimated that locusts have damaged crops across an area of at least 3.6 lakh hectares in 10 districts of Western Rajasthan. In 2019, after damage to Kharif crop, Rabi crops are under threat of locus attacks.

Area under attack of locust in Rajasthan

The worst-affected are Barmer and Jaisalmer in Rajasthan. As per the information put before the chief minister, the districts of Jaisalmer, Barmer, Jalore, Jodhpur, Bikaner, Churu, Sriganganagar, Hanumangarh and Nagaur are under locust threat.

Measures to Control the Locust Plague

Farmers in Rajasthan are using loud speakers and DJs during late evening and early morning to keep locusts away.

International Cooperation:

In January 2020, a team of officers of Food and Agriculture Organisation (FAO), Rome visited the locust affected areas of Jaisalmer district and witnessed the locust control activities on the field.

The the members of the Locust Control board from India and Pakistan are have conducted meetings to exchange information on the current locust situation.

Government Action

Locust Warning Organisation (LWO), Jodhpur has launched efforts on a war footing to control locusts. Teams carrying equipment have been rushed to the villages to spray high-intensity malathion insecticide to prevent the spread of locusts to other areas. So far, control measures have been done on 3.70 lakh hectare affected land by spraying 2.60 lakh litre melathion.

54 teams of the **Agriculture Department** are surveying and monitoring the situation. The LWO has set up a helpline for farmers in the State.

In the locust affected districts, 411 free of cost tractor mounted sprayer were made available by Rajasthan Agriculture Competitiveness Project (RACP) and 620 by Sub-Mission on Agricultural Mechanisation. For monitoring of hopper, **Rajkisan Locust Mobile App** was developed by the department of agriculture.

Locust Warning Organisation (LWO), Government of India provided 2 helicopters and 15 drones to control locust in the unreachable areas of the state and 104 vehicle mounted sprayers also used

Compensation:

On December 30, Rajasthan CM had announced to conduct **girdawari** (survey) for the assessment of loss caused to crops due to locust attack in Western Rajasthan.

Recently, the Rajasthan state government announced compensation worth Rs 31 crore for four affected districts – Jaisalmer, Barmer, Jalore and Jodhpur – after conducting a special assessment of losses.

However, farmers are unhappy with compensation norms. As per norms, compensation is given to farmers who have lost at least 33% or more crops due to locust attacks. The damaged crop of entire village, hamlet or panchayat, and not for an individual farmer, is taken into account for calculating 33%. Additionally, there is news that the government will pay compensation for only about two hectares of land. The government should, instead, check damaged areas of individual farmer's cultivated area for compensation purposes.

Two Farmers from State awarded Padam Shri

2019: Hukumchand Patidar from Manpura, Jhalawar and **Jagdish Chand Pareek** from Ajitgarh, Sikar have been awarded with Padma Shri for using and promoting organic farming. Both these farmers never used a drop of chemical fertilizer and have now become examples for other farmers in the state.

Zero budget natural farming in Rajasthan

During her budget 2019-20 speech in July 2019, Union finance minister, Nirmala Sitaraman highlighted the government thrust on Zero based natural farming as one of the possible solution for doubling farmer's income. Later, Rajasthan Chief Minister, Ashok Gehlot also announced that State Budget 2019-20 will encourage 'natural farming'. Consequently it has been decided that Zero Budget Natural Farming will be taken up in 36 Gram Panchayat of Banswara, Tonk and Sirohi at the cost of `10 crore, benefiting 20 thousand farmers.

What is Zero Budget Natural Farming?

Subhash Palekar, an agriculturalist from Belora village of Amravati district in Maharashtra's Vidarbha region is the creator of the 'Zero Budget Natural Farming' model in India. The word 'budget' refers to credit and expenses, thus the phrase 'Zero Budget' means without using any credit, and without spending any money on purchased inputs. 'Natural farming' means farming with Nature and without chemicals.

Zero budget natural farming (ZBNF) is a method of chemical free agriculture based out of traditional Indian practices. It has attained wide success in southern India, especially the southern Indian state of Karnataka where it first evolved. Additionally, in this method of farming, the cost of growing and harvesting plants is zero. This means that farmers need not purchase fertilizers and pesticides from market to ensure the healthy growth of crops.

The Four Pillars of ZBNF

1. Jivamrita/jeevamrutha: ZBNF promotes the application of *jeevamrutha* — a mixture of fresh desi cow dung and aged desi cow urine, jaggery, pulse flour, water and soil — on farmland. This is a fermented microbial culture that adds nutrients to the soil, and acts as a catalytic agent to promote the activity of microorganisms and earthworms in the soil.

2. Bijamrita/beejamrutha: It is composed of similar ingredients as jeevamrutha – local cow dung, a powerful natural fungicide, and cow urine, a strong anti-bacterial liquid, lime, soil. It is used for treatment of seeds, seedlings or any planting material.

3. Acchadana – Mulching: According to Palekar, there are three types of mulching:

- ***Soil Mulch:*** This protects topsoil during cultivation and does not destroy it by tilling. It promotes aeration and water retention in the soil. Palekar suggests avoiding deep ploughing.
- ***Straw Mulch:*** Straw material usually refers to the dried biomass waste of previous crops, but as Palekar suggests, it can be composed of the dead material of any living being (plants, animals, etc). Palekar's approach to soil fertility is very simple – provide dry organic material which will decompose and form humus through the activity of the soil biota which is activated by microbial cultures.
- ***Live Mulch*** **(symbiotic intercrops and mixed crops):** According to Palekar, it is essential to develop multiple cropping patterns of monocotyledons (monocots; Monocotyledons seedlings have one seed leaf) and dicotyledons (dicots; Dicotyledons seedlings have two seed leaves) grown in the same field, to supply all essential elements to the soil and crops. For instance, legumes are of the dicot group and are nitrogen-fixing plants. Monocots such as rice and wheat supply other elements like potash, phosphate and sulphur.

4. Whapasa – Moisture: Palekar challenges the idea that plant roots need a lot of water, thus countering the over reliance on irrigation in green revolution farming. According to him, what roots need is water vapor. Whapasa is the condition where there are both air molecules and water molecules present in the soil, and he encourages reducing irrigation, irrigating only at noon, in alternate furrows ZBNF farmers report a significant decline in need for irrigation in ZBNF.

Besides above, The ZBNF method also promotes intercropping, contours and bunds, revival of local species of earthworms and usage of cow dung and discourages intensive irrigation and deep ploughing.

Mount Abu

The horticulture department is set to develop an agro-eco-tourism and international flower research centre at Mount Abu. As per *TOI NEWS*, the horticulture department had identified about 20 bighas of land near the sunset point for the project. The Rs10-crore project is funded under the Rashtriya Krishi Vikas Yojana (National Agriculture Development Programme).

HC notice to Centre over sale of GM food article

Rajasthan High Court has issued notice to the Union cabinet secretary, Union food and environment ministries over the sale of food article using genetically modified (GM) agriculture produce. The division bench of Justice M Rafiq and NS Dhaddha issued notice on a PIL. The petitioner asserted that Food Safety and Standard Act 2006 bans the production, sale and distribution of food items using genetically modified agriculture produce. But on February 9 last year, the Union ministry of health and family welfare in a reply in Parliament said so far, no rules have been made for the prevention of the sale of food items made out genetically modified agriculture produce. The petitioner said, GM food article are sold and imported in large quantity to the country taking advantage of the loop holes in the system.

A survey conducted by the Centre for Science and Environment, New Delhi found that GM products are rampantly used in in the country causing serious health hazards to the citizens.

Rajasthan Biofuel Rules 2019

With an aim to usher in a bio-fuel revolution, the state government has come out with the Biofuel Rules 2019 incorporating the best practices in the world. Rajasthan is first in the country to bring out this policy after the notification of the Government of India on April 30.

Currently, 1250 crore liters of fossil fuel is being used in the state, if only 5 percent of it is replaced by biofuel, 62 crore liters of biofuel will have to be produced in the state. This is a big opportunity for the people of the state.

Introduction of Nanotechnology based Pesticides in farming sector in Rajasthan

Rajasthan agriculture department is planning to introduce nanotechnology based products in farming. Using nanotechnology based products will help to reduce expenditure on pesticides and fertilizers, maintaining soil health and will improve quality of agriculture products as well. A private company has offered nanotechnology based products to make crops pest free and to increase production by reducing the use of fertilizers. The agriculture university has been asked to use these products in farms at agriculture research centres and centres of excellence on an experimental basis to know the results.

Nanotechnology based pesticide is made from the extract of coconut, potato, corn, soy, sugarcane, and vegetables. This product is environmental friendly and pure. The most important thing about this is that it will kill only the enemy pests and not friendly insects.

Nanotechnology based fertilizer are made of nano-sized nitrogen molecules coated in a polymer coating that protects the fertilizer from the elements. This coating contains nano-sized 'biosensors' made up of a very specific chemical compound that allow the fertilizer to be released into the soil when the plant needs it. The product is made from the extract of vegetables and cereals, and it will bring down the consumption of fertilizers by 40 per cent.

Pearl Farming in Rajasthan

Rajasthan Government is exploring ways to develop pearl farming in the state. The government has made all preparations for the pilot project which will be launched in Jaipur and the agriculture department has decided to send a team of officials to Odisha for a week-long training programme on pearl farming for the purpose.

What is Pearl?

A **pearl** is a hard object produced by mollusks(a type of sea-animal with shells). They are used in jewelry along with other precious stones like diamond etc. They are majorly of two types: natural pearls and cultured pearls.

Natural Pearls:

Natural pearls form under a set of accidental conditions when a microscopic intruder or parasite enters a bivalve mollusk and settles inside the shell. After a couple of years, a pearl forms and the shell may be found by a lucky pearl fisher.

Cultured Pearls:

Cultured Pearls are produced artificially through various methods including using freshwater or seawater shells, transplanting the graft into the mantle or into the gonad, and adding a spherical bead as a nucleus. Most saltwater cultured pearls are grown with beads. The cultured pearls make up nearly 100% of the pearls sold today. Natural pearls now only account for less than 1/1000th of a percent of the pearls on the market today.

Cultured pearls can be distinguished from natural pearls by X-ray examination.

What is Pearl Farming?

Pearl farming is the culture of producing pearls under controlled conditions through farming of creatures called as *Oyesters*. Cultured pearls are grown on what are known as pearl farms. Several thousand oysters are nucleated and then cared for during the 2-5 years required for a pearl to grow and develop. Like any other form of farming, pearl farming can be as dependent on luck as it is on skill. An entire bed of oysters can be completely devastated by unpredictable and uncontrollable factors, such as water pollution, severe storms, excessive heat or cold, disease and many other natural and man-made phenomena.

How Do Oysters Make Pearls?

A natural pearl begins its life inside an oyster's shell when an intruder, such as a grain of sand or bit of floating food, slips in between one of the two shells of the oyster, a type of mollusk, and the protective layer that covers the mollusk's organs, called the mantle.

In order to protect itself from irritation, the oyster will quickly begin covering the uninvited visitor with layers of nacre — the mineral substance that fashions the mollusk's shells. Layer upon layer of nacre, also known as mother-of-pearl, coat the grain of sand until the iridescent gem is formed.

Cultured pearls are made in the same way. The only difference is that instead of accidental circumstances, a "pearl farmer" embeds a grain of sand into the mollusk.

Now, what is Rajasthan Government planning?

Rajasthan Government is planning to start pearl farming in Rajasthan as it has potential to give good returns to our farmers. To start with, officials will receive training from a pearl culture institute in Bhubaneswar. From Odisha, we will also be bringing oysters and mussels to facilitate pearl cultivation. Additionally, a pond with brackish water has already been readied for the purpose while the construction of a state-of-the-art lab for grafting tissues from oyster shells is underway. The government is also in process of identifying a fresh water source near Kota region to launch similar project.

As per the plan, farmers from various parts of the state, who want to diversify into other areas of production, will be identified and exposed to this farming option and required technologies. Along with this, the government will also take up the task of marketing pearls

Government Departments & Schemes

Agriculture Department

The Department of Agriculture is responsible for agriculture, food production, farmer's income & other related activities. The main schemes implemented by Agriculture department include:

Mukhyamantri Beej Swavalamban Yojana:

The main objective of the scheme is to promote the production of quality seeds by the farmers in their own fields.

- Initially the scheme was started in the 3 agro-climatic zones viz.: Kota, Bhilwara and Udaipur.
- From 2018-19, the scheme is being implemented in all 10 agro-climatic zones of the state.
- Seed production of Wheat, Barley, Gram, Jowar, Soybean, Moong, Moth, Groundnut, and Urad varieties upto 10 years old are being taken under the scheme.

Eradication of pest and diseases in non-endemic areas:

It is very important to protect crops from infestation of insects, pests and diseases to keep causal organisms, insects/pests population below Economic Threshold Level (ETL) for efficient economic production. Therefore, provision has been kept for eradication of pests/diseases in Endemic/Non endemic areas by use of plant protection chemicals.

> *In integrated pest management, the economic threshold is the density of a pest at which a control treatment will provide an economic return. An economic threshold is the insect's population level or extent of crop damage at which the value of the crop destroyed exceeds the cost of controlling the pest.*

Training for women:

- One-day trainings for women are being organized at Gram Panchayat level where in the government provides an assistance of 3,000 per training for 30 women farmers.
- They are being trained in agricultural technology to disseminate the technology to fellow farmers. Apart from the above activity, incentive for crop cutting experiment is also included under Agriculture extension service.

Incentive to Girls in Agricultural Education:

Department of Agriculture is providing incentives at Senior Secondary, Graduation, Post-Graduation and Ph.D. levels. State Government is providing assistances of:

- Rs 5,000 per girl per year for Senior Secondary (Agriculture),
- Rs 12,000 per girl per year for B.Sc. (Ag), M.Sc. (Ag);
- Rs 15,000 per girl per year for Ph.D.

Agriculture Demonstration:

- Crop demonstrations are being organised on farmers' fields for communicating agriculture technology on the principle of "seeing is believing" to the farmers.
- Demonstrations of state specific crops, Gwar, Barley and Wheat in non-National Food Security Mission (NFSM) districts are being organized.

Seed Mini-kit:

- Seed mini-kits are given to farmers at token amounts for 0.1 hectare area to popularize the newly released varieties of different crops among the farmers.

Micronutrient Mini-kit:

- Micronutrient mini-kits are being provided to farmers at 90 per cent subsidy on the basis of Soil Health Cards to enhance use of micronutrient for increasing crop production.
- Besides, activities such as operation of Adaptive Trial Centres and Award to cultivators for adoption of organic farming practices are also undertaken.

Zero Budget Natural Farming:

- In compliance of Budget Announcement 2019-20 made by Hon'ble Chief Minister, a pilot project on Zero Budget Natural Farming is being implemented in **Tonk, Banswara and Sirohi** districts of the state.
- For the year 2020-21 the programme is proposed in 15 districts on Andhra Pradesh pattern and submitted to the state government for approval.

- This will eventually make the farmers self-sustainable through the use of agri-inputs prepared by themselves in-farm and reduce the cost of cultivation, it would also allow them to grow chemical free agriculture produce.

Rajasthan Agricultural Competitiveness Project (RACP):

- With the objective to increase production and productivity, farmer's income, promote climate resilient agriculture, reduce water use in agriculture, and involve farmers in processing and value addition, RACP is being implemented in 17 clusters of 17 districts of the state with credit from **World Bank**.
- Besides, establishment/operating expenses of field staff/labs/Kisan Aayog/capital works, Kisan Seva Kendra cum village knowledge centre, Information and Media support, Computerization and State Matching Share towards Central Sponsored Schemes have also been included in the State Plan.

National Food Security Mission (NFSM)

National Food Security Mission on Wheat and Pulses was launched in Rajasthan in the year 2007-08 as a centrally sponsored scheme by the Central Government. During the year 2015-16, GoI has changed the funding pattern and now GoI : GoR ratio is 60:40.

Components in Rajasthan:

- NFSM Pulses
- NFSM Wheat
- NFSM Coarse Cereals
- Nutri Cereals Bajra
- Nutri Cereals JOWAR
- Commercial Crops Cotton

Coverage Districts:

Scheme	No. of Districts	Districts
NFSM - Pulses	**33**	**All**
NFSM - Wheat	**14**	Banswara, Bhilwara, Bikaner, Jaipur, Jhunjhunu,

		Jodhpur, Karauli, Nagaur, Pali, Pratapgarh, Sawai-Madhopur, Sikar, Tonk and Udaipur
NFSM – Coarse Cereals	**11**	
Coarse Cereal - Maize	**5**	Banswara, Bhilwara, Chittorgarh, Dungarpur & Udaipur
Coarse Cereal - Barley	**7**	Ajmer, Bhilwara, Hanumangarh, Jaipur, Nagaur, Sri-Ganganagar, and Sikar
Nutri Cereals - Bajra	**21**	Ajmer, Alwar, Barmer, Bharatpur, Bikaner, Churu, Dausa, Dholpur, Hanumangarh, Jaipur, Jaisalmer, Jalore, Jhunjhunu, Jodhpur, Karauli, Nagaur, Pali, Sawai Madhopur, Sikar, Sirohi and Tonk
Nutri Cereals - Jowar	**10**	Ajmer Alwar, Bharatpur, Bhilwara, Chittorgarh, Jaipur, Jodhpur, Nagaur, Pali and Tonk
NFSM - Cotton	**32**	All Except Pratapgarh

Salient Features:

- The major interventions of **NFSM-Wheat and Pulses** relates to distribution of certified seeds, demonstration on improved production technology, support to farmers by providing biofertilizers, micronutrients and gypsum, Integrated Pest Management (IPM), agricultural implements, sprinklers, pump sets, pipe line for carrying irrigation water and cropping system based training.
- NFSM-Nutri-Cereals mission was launched in Rajasthan in 2018-19 as a Centrally Sponsored Scheme.
- The Major interventions in NFSM Nutri-Cereals relates to distribution of certified seeds, production of certified seed, demonstration on improved production technology, support to bio-fertilizer, micronutrients, integrated Pest Management (IPM) and cropping system based training for farmers.
- NFSM-Commercial Crops: Front line demonstration and distribution of plant protection chemicals for cotton crop.
- NFSM Oil seed & TBOS: Main Components of this mission are production of foundation seeds and certified seeds, distribution of certified seeds, crop demonstration, Integrated Pest Management (IPM), plant protection from chemicals, distribution of PP equipment, biofertilizer,

Gypsum, pipes for carrying water, farmers' trainings, agriculture implements, innovative seed treatment drums, sprinkler set, distribution of mini-kits, infrastructure development etc. Funding pattern between GoI and GoR is 60:40.

National Mission On Agriculture Extension and Technology (NMAET)

The aim of the Mission is to restructure & strengthen agricultural extension to enable delivery of appropriate technology and improved agronomic practices to the farmers. During the year 2015-16, GoI has reduced the funding pattern between GoI and GoR to 60:40. NMAET consist on 5 sub-missions:

- Sub Mission on Agriculture Extension (SMAE)
- Sub-Mission on Seed and Planting Material (SMSP)
- Sub Mission on Agriculture Mechanization (SMAM)
- National e-governance plan in agriculture (NeGP-A)

National Mission for Sustainable Agriculture (NMSA)

NMSA is one of the restructured schemes subsuming National Mission on Micro Irrigation, National Project on Organic Farming, National Project on Management of Soil health & Fertility and Rainfed Area Development Programme to focus on Climatechange adaptation, being implemented since the year 2014-15. Share of Center: State in funding is 60: 40 percent.

National Mission for Sustainable Agriculture (NMSA) consists of 4 sub missions:

- Rainfed Area Development (RAD)
- Paramparagat Krishi Vikas Yojana (PKVY)
- Soil Health Management and soil health card
- Sub-Mission on Agro-forestry

Rain-fed Area Development (RAD):

- Different types of area-specific Integrated Farming Systems (IFS) have been envisaged in different agro-climatic zones of the State i.e. Livestock based, horticulture based and agro-forestry (Tree) based farming systems.
- Assistance is being provided for various IFS activities and allied activities.
- The farming systems are being taken up along with other activities like establishment of vermi compost units, construction of water harvesting structures and green houses, and beekeeping.

Soil Health Card Scheme ("Swasth Dhara Khet Hara"):

- The scheme envisages promoting the soil testing services, issue of soil health cards and development of judicious nutrient management practices for different crops.

Paramparagat Krishi Vikas Yojana (PKVY):

- Organic agriculture is production of agricultural products free from chemicals and pesticide residues, by adopting eco-friendly low cost technologies.
- Under PKVY, organic farming is promoted through adoption of organic village by cluster approach and Participatory Guarantee Systems (PGS) certification.
- Participatory Guarantee System under PGS-India programme is the key approach for quality assurance under the PKVY. The farmers have options to adopt any form of organic farming in compliance with PGS-India standards.

Sub-Mission on Agro-forestry (SMAF):

- SubMission on Agro-Forestry was launched in 2017-18 with the objective to encourage and expanding tree plantation in agriculture, ensuring availability of quality planting material and popularizing various Agro-Forestry Practices and models for different agro climatic zones and land use conditions and to creating database and knowledge support in the area of agro-forestry.
- The funding pattern with respect to GoI: GoR is 60:40.

Rashtriya Krishi Vikas Yojana (RKVY/ National Agriculture Development Programme)

- Government of India started RKVY (2007-08) during 11th five year to achieve the 4 per cent growth rate in Agriculture and allied sector.
- The scheme aims to draw up plans for agriculture sector more comprehensively, taking into account agro-climatic conditions, natural resource issues and technology.
- In this scheme project based assistance is provided to prepare Integrated District Agriculture plan in the field of Agriculture, Animal Husbandry, Fisheries, Poultry, Horticulture and Dairy, considering the agro-climatic conditions and natural resources of the State.
- During the year 2015-16, GoI has reduced the funding pattern to 60:40 (GoI: GoR).

Pradhan Mantri Krishi Sinchai Yojana (PMKSY)

- PMKSY has been conceived as an amalgamation of ongoing schemes viz. Accelerated Irrigation Benefit Programme (AIBP), Integrated Watershed Management Programme (IWMP) and the On Farm Water Management (OFWM).
- PMKSY is being implemented in the state, since 2015-16. PMKSY funding pattern between GoI: GoR is 60:40.
- **Horticulture department is the Nodal department** and different activities are being implemented by Agriculture, Horticulture, Watershed development & soil conservation and Water Resource department.

Pradhan Mantri Fasal Bima Yojana (PMFBY)

- PMFBY was restructured by the Weather Based Crop Insurance Scheme (WBCIS) and modified National Agriculture Insurance Scheme (NAIS) during the year 2016-17.
- This scheme has been implemented since kharif crops 2016.
- The scheme covers food grain crops (cereals, millets and pulses), oilseeds and Annual Commercial/Annual Horticultural crops.
- The farmer premium for Kharif crops, Rabi crops and Annual Commercial/Annual Horticulture crops is 2 per cent, 1.5 per cent and 5 per cent respectively. According to the revamped guidelines of PMFBY issued by the Government of India from Kharif 2020, the maximum premium subsidy to be borne by the GoI would be 25 per cent for irrigated area and 30 per cent for non-irrigated area
- For payment of premium subsidy and incentive to primary workers for conducting crop-cutting experiments, a state funded scheme is in operation.

Krishi Karman Awards

- The Ministry of Agriculture and Farmers Welfare, Government of India has given Karman Award Krishi Karman Award for the year 2016-17, for outstanding performance in the pulses production category.
- 2.00 crore, citation and trophy given as Krishi Karman Award.
- Additionally, two progressive farmers of the state, one male and one female farmer were given each *2 lakh and citation.

- The state also received a commendation award of 31.00 crore in the pulses category for the year 2017-18 on 2 January, 2020.

Horticulture

Directorate of Horticulture was established in 1989-90, with the objective of growth in area, production & productivity of fruits, vegetables, spices, flowers and medicinal plant crops in a planned way. Recent initiatives include:

- Vegetable cluster in urban areas,
- Establishment of center of excellences at Jhalawar, Dholpur, Tonk, Bundi, Chittorgarh and Sawai Madhopur
- Centre of excellence of pomegranate, Bassi (Jaipur) and and Citrus Nanta (Kota)

National Horticulture Mission (NHM)

To increase the area, production and productivity of different horticulture crops like fruits, spices and flowers in selected 24 districts namely Jaipur, Ajmer, Alwar, Chittorgarh, Kota, Baran, Jhalawar, Jodhpur, Pali, Jalore, Barmer, Nagaur, Banswara, Tonk, Karauli, Sawai Madhopur, Udaipur, Dungarpur, Bhilwara, Bundi, Jhunjhunu, Sirohi, Jaisalmer and Sri-Ganganagar.

Activities include establishing fruit orchards, providing green-houses, plastic tunnels, plastic mulching, vermin-compost units, low cost onion storage units, pack-houses and water harvesting structures etc.

Pradhan Mantri Krishi Sinchai Yojana – Micro Irrigation (PMKSY-MI)

- Additionally, during 2015-16, Government of India launched Micro Irrigation Scheme under PMKSY.
- The ratio of central share and state share for all categories of the farmers is 60:40. To increase the adoptability of the system, during 2020-21 Government of India is providing subsidy to different categories of the farmers, Government of Rajasthan is also providing additional subsidy.
- Activities include promoting efficient water management practices (like drip & sprinkler irrigation) to improve crop yields & quality along with water-saving.
- Under drip and mini sprinkler and sprinkler irrigation an area of 13,755 hectare and 28,526 hectare have been covered respectively upto December, 2020.

Solar Power Based Pump Project (Prime Minister 'KUSUM' Yojana Component 'B')

PM 'KUSUM' Component B is Prime Minister Kisan Urja Suraksha and Utthan Mahabhiyan) Component-B Stand Alone Solar Energy Pump Plant.

The Ministry of New and Renewable Energy, Government of India is implementing this scheme from the year 2019-20. There is a provision for setting up of solar pumps ranging from 3 HP to 10 HP capacity, with the maximum subsidy payable up to 7.5 HP capacity.

A total of 40,224 solar pump plants have been installed in the state from the year 2010-11 to 2018-19, which are producing about 161 megawatt of power and irrigating an area of about 1,00,000 hectare.

Under this scheme, total 60 per cent subsidy (central share 30 per cent, state share 30 per cent) is payable. In the year 2020-21, 5,011 solar plants have been installed upto December, 2020 against the physical targets of 25,000 solar plants

Rashtriya Krishi Vikas Yojana (RKVY)

Under this scheme activities include

- Date palm cultivation, horticulture development programme in non NHM districts,
- Vegetable cluster in urban areas,
- Establishment of center of excellences at Jhalawar, Dholpur, Tonk, Bundi, Chittorgarh and Sawai- Madhopur,
- Strengthening of center of excellence of pomegranate in Bassi (Jaipur) and Nanta (Kota),
- Promotion of protected cultivation; skill up-gradation in citrus production.

National Agro-Forestry and Bamboo Mission (NABM)

Under this scheme, the districts of Karauli, Sawai-Madhopur, Udaipur, Chittorgarh, Banswara, Dungarpur, Sirohi, Baran, Jhalawar, Bhilwara, Rajasmand and Pratapgarh were taken up for promoting bamboo cultivation.

National Mission of medicinal plants

National Mission of Medicinal Plants aims at promoting cultivation of medicinal plants, raw materials to pharmacy sector could easily be made available in sufficient quantity. Ayush Department of Rajasthan is the nodal agency for implementing the scheme.

Agricultural Marketing

The Directorate of Agriculture Marketing is functioning in the State to implement 'Mandi Regulation and Management' effectively.

Rajeev Gandhi Krishak Sathi Sahayata Yojana

- Rajeev Gandhi Krishak Sathi Sahayata Yojana provides financial assistance for agriculture marketing to agriculturist, agricultural labourer and hamals.
- Under this scheme, financial assistance have been provided to the tune of 2 lakh in the case of work-site accidental death.

Kisan Kaleva Yojana

- Kisan Kaleva Yojana has been introduced for farmers to provide them quality food on subsidized rates in 'Super', 'A' and 'B' class krishi upaj mandi samities of the State (except in fruit & vegetable mandi yards).

Mahatma Jyotiba Phoole Mandi Sharmik Kalyan Yojana 2015

Mahatma Jyotiba Phoole Mandi Sharmik Kalyan Yojana 2015 has been launched in the State. Important features of the scheme are:

- **Pregnancy assistance** of rupees equivalent to 45 days non-skilled labour rate is being provided to license holder lady labourer for two pregnancy period. Further amount equivalent to 15 days non skilled labour rate are also being provided to the father of newly born child.
- **Marriage Assistance:** Licensed lady labourer will be entitled for a sum of `50,000 for marriage. This assistance is limited for marriage of upto 2 daughters only.
- **Scholarship:** The son/daughter of licensed labourer obtaining 60 per cent or above marks is entitled for scholarship under this scheme.
- **Medical Assistance:** Financial assistance of `20,000 will be given to licensed labourer in case of serious disease (Cancer, Heart attack, Liver Kidney etc.) if he might have been admitted for treatment in government hospital or any hospital authorized by government.
- **Parental Leave:** Parental leave of amount equivalent to 15 days non skilled labour rate is being provided to licence holder men labourer for two pregnancy period. Amount equivalent to 15 days non skilled labour rate being provided to the father of newly born child.

Krishi Kalyan Kosh

Taking the first major step towards 'Ease of Doing Farming' on the lines of 'Ease of Doing Business' in the Rajasthan Budget 2019-20, the formation of a farmers welfare fund named as Krishi Kalyan Kosh (K3) was announced by the Chief Minister with a corpus of 1,000 crores.

A total loan of ₹2,000 crore have been borrowed from banks for this fund. The fund will be used for fair prices of agriculture produce and to promote any other activities connected with the farmers welfare with the prior approval of the government.

Prime Minister Formalisation of Micro Food Processing Enterprises (PM-FME)

The PM-FME scheme has been launched by the Ministry of Food Processing Industry, Government of India to upgrade the unorganized food processing sector in the country. The Rajasthan State Agricultural Marketing Board is designated as the nodal agency to implement the scheme in the State.

The major objectives of the schemes are as under-

- Increased access to credit by existing micro processing entrepreneurs, FPO's, self helf groups and co-operatives.
- Integration with organized supply chain by strengthening branding and marketing.
- Support for transition of existing 2 lakh enterprises into formal framework.
- Increased access to common processing facility, laboratories and storage, packaging, marketing and incubation services.
- Strengthening of institutions, research and training in food processing sector.
- Increased access for the enterprises, to professional and technical support.

Water Resources:

Irrigation potential of the sate has been raised to 38.60 lakh hectare by 2018-19, while before independence it was only 4 lakh hectare surface irrigation. During the year 2019-30, irrigation schemes are under progress include:

- **7 major Projects**
    - Narmada Canal Project,
    - Parwan,
    - Dholpur lift,
    - Rajasthan Water Sector Restructuring Project (RWSRP) for desert area,
    - Navnera Barrage (ERCP),

  - Upper high level canal
  - Piplakhunt
- **6 Medium projects**
  - Garadada, Takli, Gagrin, Lhasi, Rajgarh and Hatiyadeh
- **46 minor irrigation schemes**

Besides these,

Parwan Irrigation Project

- Construction of Dam under execution in Akawad Kalan, Khanpur, district Jhalawar on Parwan river.
- Along with drinking water to 1821 villages, this project will provide irrigation facility in 2,01,400 hectare CCA in 637 villages of Jhalawar, Baran and Kota district.
- The project will also provide 79 million cubic meters of water to the Thermal Power Project, which will produce 2,970 Megawatt electricity.

Narmada Canal Project

- For first time, Sprinkler irrigation system has been made compulsory in entire command area of 2.46 hectare of Jalore and Barmer districts.

Navnera Barrage (ERCP):

- This project will be an integral part of ERCP.

Eastern Rajasthan Canal Project (ERCP)

- Transfer the surplus water of Kool, Kunu, Parvati, Kalisindh, Mej and Chakan river into the Banas, Morel, Banganga, Gambhir and Parbati river in basin of Chambal river during monsoon period.

Rajasthan Water Sector Livelihood Improvement Project (RWSLIP)

- RWSLIP has been sanctioned for getting loan assistance from JICA for rehabilitation and renovation of 137 Irrigation Project in 27 districts.
- Total CCA to be treated under this project is 4.70 lakh hectare.
- Project period will be 08 year and implemented in three stages.
- The proposed 137 irrigation project includes Bhakra Canal System, Gurgaon Canal System, medium & minor irrigation project of 27 district.

Rajasthan Water Sector Restructuring Project in Desert Area (RWSRPD)

- RWSRPD has been financed by New Development Bank, for rehabilitation & restructuring of existing IGNP stage I system.
- It will benefit Sri-Ganganagar, Hanumangarh, Churu, Nagaur, Bikaner, Jodhpur, Jaisalmer and Barmer districts.
- Revamping of IGNP system will reclaim 22,831 hectare of water-logged area.

National Hydrology Project

- This Project is funded by Ministry of Jal Shakti, Government of India (World Bank Project).
- Total project cost is `128 crore (100 per cent grant in aid from GoI) and duration is 8 years (2016-17 to 2023-24).
- This project will help in availability of real-time meteorological and water related data for water resources management in the state. It will help in development of real time decision support system for flood, drought management, improved water use efficiency and IWRM.
- This will also help in availability & transmission of water related information and meteorological forecast to the public through public domain of Water Resources Information System (WRIS).
- The first SCADA system has been installed on the **Bisalpur dam** in the state for transparent water management in the dams and canal system

Relining of Indira Gandhi Feeder (Punjab Portion) & Sirhind Feeder

A tripartite MoU has been signed by Government of India, Government of Rajasthan and Government of Punjab on 23 January, 2019 for relining of Indira Gandhi Feeder (Punjab portion) & Sirhind Feeder.

Dam Rehabilitation & Improvement Project (DRIP)

For restoration & rehabilitation of large dams of state, a World Bank aided Dam Rehabilitation & Improvement Project (DRIP) is being executed.

The first phase of the scheme tenders have invited for 7 dams Bisalpur Dam, Chhapi Dam (Jhalawar), Jawai Dam, Sukli Selwada Dam (Sirohi), Mahi Dam, Gambhiri Dam (Chittorgarh) and Matrakundi Dam (Bhilwara).

DPR of 6 dams Rana Pratap Sagar, Jawahar Sagar, Kota Barrage, Raipur Luni Dam (Pali), Chhaparwada Dam (Jaipur) and Panchana Dam (Karauli) has been sent to the Central Water Commission for approval.

Out of which DPR of 4 dams (Rana Pratap Sagar, Jawahar Sagar, Kota Barrage and Panchana Dam) has been approved by the World Bank.

Rajasthan has ranked **first** among the 18 states involved in DRIP project through time-bound efforts.

Ground Water

Ground Water Department plays an important role in the development and management of ground water resources of the State.

National Hydrology Project

To provide technical inputs for drought management by using seasonal yield data for forecasting crop production and providing information on ground water conditions, National Hydrology Project has been approved by the World Bank and Central Government.

The Water resource Department, Rajasthan is the nodal department and Ground Water Department is an associate department in this project.

Atal Bhu Jal Scheme

Atal Bhu Jal scheme is launched on 1st April, 2020 by Government of India with assistance of World Bank (50:50) in seven state of the country i. e. Hariyana, Gujarat, Karnataka, Maharastra, Rajasthan, Uttar Pradesh and Madhya Pradesh to prevent the falling ground water and better management of ground water.

This plan is for five years 2020-21 to 2024-25. The estimated cost of the scheme is ₹6,000 crore, out of which ₹3,000 crore is the share of the World Bank and ₹3,000 crore is part of the Government of India, out of which the total budget amount for the state of Rajasthan for 5 years is ₹1,189.65 crore as grant.

Under this scheme, 1,144 gram panchayats of 38 panchayat samiti of 17 districts of Rajasthan states have been identified. A water security plan is proposed to be prepared for the identified 1,144 at gram panchayat level.

Watershed Development

Rajasthan, with a geographical area of 342.87 lakh hectare, is the largest State of the country, having 10.40 per cent of the total area of the country. Out of this area, about 101 lakh hectare is waste land.

Despite being the largest state in terms of area, only 1.16 per cent of total water resources is available in the state. The annual rainfall in the state also varies from 100 mm in the arid west to 900 mm in the South-East.

Usually, every three out of five years, most districts of the state are affected by drought because of uncertain and varied distributions of rainfall. Moreover, owing to high intensity of rainfall and improper water conservation system, a large percentage of this rainfall goes waste resulting in continuous depletion of water table and further, conversion of cultivable land into waste-land.

Rajiv Gandhi Jal Sanchay Yojna (RGJSY)

To resolve these serious issues, the State Government has decided to launch **Rajiv Gandhi Jal Sanchay Yojna (RGJSY)** to ensure maximum rainwater harvesting, water conservation and judicious use of available water sources in the State.

Rajiv Gandhi Jal Sanchay Yojna (RGJSY) is being implemented with effective convergence of various Central and State schemes, effective convergence of funds, assistance of Corporate, Religious trusts, Social sects, NGOs and public contribution, and by providing State fund to execute water conservation and water harvesting activities.

Major Objectives of RGJSY:

- To generate awareness about water conservation.
- To ensure effective implementation of rejuvenation of traditional water resources, construction of new water sources, water conservation and water harvesting related activities in rural areas from available financial resources (Centre, State, Corporate, Trusts and People's participation) through effective convergence.
- To make efforts to ensure availability of drinking water within village/ nearby village vicinity and resolve the issue of shortage of drinking water.

- To improve the status of ground water availability and to check the rate of depletion of water table.
- To increase cultivable area and irrigated area through water conservation and rain water harvesting activities.
- To increase green cover through intensive afforestation

Major Activities:

- Watershed (catchment) area treatment: Trenches, Farm Ponds, Mini Percolation Tank (MPT), Khadin, Johar, Tanka, Small Anicuts, Earthen check dams, Water harvesting structures, Field Bund, Water storage structures etc.
- Repair of minor irrigation work, renovation and reinforcement work.
- Reinforcement of drinking water sources.
- Construction of artificial recharge structures.
- Pasture development & plantation.
- Promotion of advanced methods of cropping & horticulture (Drip, Solar pump etc.).

The first phase of Rajiv Gandhi Jal Sanchay Yojna commenced on 20 August 2019 in around 4,000 villages of all 295 blocks of all 33 districts of the State. The completion period of phase-I is two years.

Under Pradhan Mantri Krishi Sinchai Yojana (Watershed Component) the funding pattern with respect to GoI: GoR is 60:40.

State Warehousing

The Central and State Warehousing Corporations were established in the country for the purpose of Warehousing of Agricultural Produce and certain other commodities. The Central Warehousing Corporation (CWC) has jurisdiction all over India while the activities of the State Warehousing Corporations are restricted to their respective States.

In Rajasthan, the **Rajasthan State Warehousing Corporation (RSWC)** was established on 30th December, 1957 which actually started functioning w.e.f. 24th March, 1958. The main activity of the Rajasthan State Warehousing Corporation (RSWC) is to build godowns and warehouses in the State for scientific storage of agricultural produces, seeds, manures, fertilizers, agricultural implements and other notified commodities of the farmers' co-operative societies, traders, Government and other institutions.

The Corporation is operating 93 warehouses in 31 districts of the State with the total storage capacity of 16.20 lakh metric tonnes.

The Corporation is providing 70 per cent, 60 per cent and 10 per cent rebate for storage charges to SC/ST farmers, general farmers and co-operative societies respectively

Animal Husbandry

In Rajasthan, Animal Husbandry is not merely a subsidiary to agriculture but it is a major economic activity, especially in arid and semi-arid areas. The State is endowed with finest drought hardy milch breeds (Rathi, Gir, Sahiwal and Tharparkar), dual purpose breeds (Kankrej and Haryana) and the famous drafts breeds of Nagori and Malvi.

The livestock Census-2019 has placed total livestock population of the State at 567.76 lakh and poultry birds at 146.23 lakh. The State has about 10.60 per cent of the livestock of the country. It accounts for about 7.23 per cent of cattle, 12.47 per cent of buffaloes, 14.00 per cent of goats, 10.64 per cent of sheep and 84.43 per cent of camels of the country. The State contributed 12.72 per cent of milk and 34.46 per cent of wool to the nation's production in the year 2017-18.

Initiatives during 2019-20:

- Under the mandate of Foot and Mouth Diseases (FMD), free Rajasthan FMD-CP is being implemented in the State with the assistance of Government of India. Mass Vaccination Campaigns are going on in the State for cattle and buffalo twice a year.
- Livestock Breeders are being benefited under **Pashudhan Nishulak Arogya Yojna** regularly.
- Breed improvement program has also been strengthened.
- Training facility for livestock farmers has been improved and extended.
- Under the **National Livestock Mission**, Genetic Improvement of Goat and Sheep (GIGS) scheme has been started with the assistance of GOI:GOR with the 60:40 funding pattern. Under the scheme exhibition and training camps are organized for selection of male and female goats with preferred genetic characters. Presently the scheme is being run in Ajmer, Jaipur, Sikar, Rajsamand, Chittorgarh, Churu, Sirohi and Kuchaman city (Nagaur) Districts.
- Under the National Livestock Mission, Innovative Poultry Productivity Project (IPPP) has been started for Poultry Farmers. Under this project IPPP for Broiler and LIT Birds projects has been included.

- Establishment of 200 new veterinary sub centres have been proposed in the year 2020-21 in those gram panchayats where departmental veterinary facility is not available. Out of these, 171 new sub centres have been opened upto December, 2019.

Gopalan Department

The aim of the Directorate Gopalan is to act for propagation, conservation and development of native breeds of cattle in the state. For this purpose Directorate Gopalan approach for a sustainable and significant development of cattle rearing institutions like gaushalas/ kanji house and Nandishala's through Govansh Sanrakshan and Samvardhan Nidhi Rules, 2016.

Directorate organizes awareness and training programs for Gau palak and Gaushala representatives of state in the field of organic farming, fodder production, and value addition of milk, cow dung and cow urine also including panchgaya.

Some Important Schemes:

Nandishala public participation scheme is operated to solve the problem of destitute male cow.

The Gaushala Biogas participation scheme is operated with the aim of making the Gaushalas self-sustainable. Under this scheme 4 biogas plants has been sanctioned out of which one gaushala (Shri gaushala padampur, Shriganganagar) had completed Civil and fabrication wok and construction work in remaining 3 gaushalas is under process.

A maximum of ₹10.00 lakh is given for the construction of basic infrastructure in the registered gaushalas of the state under the Guashala Vikas Yojana. It is an Jan Sahbhagita scheme in which 90 per cent aid is given by state govt. and 10 per cent beared by the applicant Gaushala. Two Gaushalas will be selected as best district goshalas from each district of the state, so 66 best goashalas are being selected and awarded cash prize, including certificate of appreciation and momento on Republic day every year.

Kamdhenu dairy scheme is being operated for the promotion of indigenous breed, under Rastriya Krishi Vikas Yojana. 6 dairies have been established and budget release for 7 new dairies.

For conservation and propagation of Tharparkar and Gir breed of cattle, In-vivo fertilization and implantation of the embryos through embryo transfer technology is being performed under RKVY scheme. Under this scheme, 36 embryos have been implanted and 18 calves born till so far.

Dairy Development

The Dairy Development Programme in Rajasthan is being implemented through Cooperative Societies. Under this Programme, 15,318 Dairy Cooperative Societies have been affiliated with 21 District Milk Producers Cooperative Unions spread over the State and a State level Apex Body, 'Rajasthan Cooperative Dairy Federation (RCDF) Limited, Jaipur is functional.

Some Important Schemes:

Raj Saras Suraksha Kavach Bima Yojana (4th Phase)-

A personal accident insurance scheme has been implemented 1st January, 2020. Under this scheme a sum of ₹5 lakh is payable in case of accidental death/total permanent disability and ₹2.5 lakh in case of partial permanent disability.

Saras Samuhik Arogya Bima-

The 15th phase of Saras Samuhik Arogya Bima has been implemented 15th October, 2020.

Chief Minister Dugdh Utpadak Sambal Yojana-

From financial year 2020-21, under this scheme subsidy of ₹2 per liter to the milk producers in the month of April to November, 2020 by the district Milk Unions payment due/ongoing. A provision of ₹200 crore has also been made in the budget for the year 2020-21 under the scheme by the state government, against which the administration & financial approval of the ₹50 crore by Gopalan department, Government of Rajasthan.

National Livestock Mission Fodder Seed Production Procourment and Distribution project

Governement of India centrally sponsored schemes National Livestock Mission Fodder Seed Production Procourment and Distribution project at 60:40 funding pattern amounting of ₹29.63 lakh Central share RCDF has distributed 17,107 minikits of certified oats seeds to be milk producers through district milk unions. Remaining 40 per cent share borned by the beneficiaries.

Co-operatives in Agriculture

Co-operative Credit Structure

At present, there are 29 Central Cooperative Banks, 21 Milk Unions, 37 Consumer Wholesale Stores, 36 Primary Land Development Banks, 6,687 Primary Agriculture Credit Co-operative Societies and 273 Marketing and Fruit & Vegetable Societies in the State. A total of 36,122 Co-operative societies with 23 federations are registered in the State.

Short term agricultural loan on zero per cent interest rate

For the relief to the farmers of the State, the Chief Minister has announced to continue the earlier scheme of the year 2012-13 about subsidy to farmer who repay crop loan of ₹1.50 lakh in prescribed time limit. Under this announcement, Primary Agricultural Co-operative Societies have to recover only the principal loan from members and the claim for interest amount is to be adjusted by state and central government.

Rajasthan Krishak Loan Waiver Scheme 2019

In the interest of the farmers of the state, the state government has taken a historical decision by waiving off all the short term crop loan outstanding as on 30th November, 2018 to eligible loanee farmers covered under eligibility norms. A process of Aadhaar based authentication has been applied for authentication of the lonee through thumb impression. Under this scheme 20.58 lakh loanee farmers have been benefited by relief of ₹7,737.29 crore upto December, 2020.

To provide relief to those small and marginal farmers who are unable to make their land free from pledgement of banks, Rajasthan Krishak Loan Waiver Scheme 2019 (middle term/long term credit structure) has been approved for overdue loanees upto rupees ₹2 lakh as on 30th November, 2018. Under this scheme 29,946 loanee farmers have been benefited by relief of ₹348.03 crore upto 31st December, 2020.

Under Rajasthan Crop Loan Waiver Scheme 2018, total 27.96 lakh farmers have been benefited by short term crop loan waiver of ₹7,549.97 crore till December, 2020.

One Time Settlement Scheme 2020-21

One time settlement scheme 2020-21 has been initiated for making recovery of overdue loans of primary land development banks. Under this scheme all farm sector and non-farm sector loans of

PLDB's which are overdue as on 1st July, 2019 are covered. A relief of 50 per cent overdue interest will give under this scheme.

Online process of short term crop loan

Co-operative crop loan online registration and distribution Scheme 2019 has been initiated from Kharif 2019. With the objectives of restricting local discretionary power in crop loan distribution, making uniform, transparent and well managed, Aadhaar based authentication through creation of Digital Member Register (DMR), and online process from seeking application distribution and reimbursement from NABARD of short term cooperative loan, a portal has been launched by making amendment in cooperative credit policy dated 11thJuly, 2018 of the State Government.

Kisan Seva Portal

Government of Rajasthan has launched an integrated Kisan Seva Portal to provide services linked to farmer such as loan applications, subsidy etc. from one platform. This portal will help the government for policy formulation and will provide all services under one umbrella. Rajasthan is the first State to benefit farmers under Pradhan Mantri Kisan Nidhi Yojana in the country. Under this scheme, 84.08 lakh farmers have applied on the portal till December, 2020 and 74.69 lakh application forms have been uploaded. Out of which 69.71 lakh application forms of ₹1,394.29 crore were accepted and 68.08 lakh farmers have been benefitted through directly transferred to bank accounts.

Impact of innovative scheme and policy of the Government-

- The income of farmers has increased with improvement of standard of living.
- Sources of self-employment have been availed by rural youth and women.
- The impact of mechanization in agricultural sector is also reflected clearly.
- Godown facilities have been availed by farmers for storage of their grains.

Raj Sahkar Portal

It is an integrated platform. This portal can be used for various scheme of co-operative department like, as short term crop loan applications. Minimum Support Price (MSP) application, Online payment, New application of society registration, Non-Government Organization (NGO) registration, Games Federation registration, Election system of co-operative institution, Status of court case, audit report, crop loan and loan waiver status facilities,

Gyan Sagar Credit Scheme

This scheme has been started to provide entrance to rural and urban students in professional and technical courses and to provide financial assistance to students and their parents. The maximum loan limit for acquiring education in India and abroad is 6.00 lakh and 10.00 lakh, respectively. There is a provision of 0.50 per cent relief on interest rate to girls students.

Prime Minister Crop Insurance Scheme

Prime Minister Crop Insurance Scheme was started in 2016 under which, crops for those farmers who cultivate notified crops in enlisted areas are compulsorily insured. According to the notification of Agriculture Department of the State, Central Cooperative Banks need to send premium and declaration form to the insurance company concerned. A new portal has been launched by the Central government for this scheme. Information related to farmers/crops has to be uploaded by Central Cooperative Banks of the State.

Under kharif 2020, insurance premium amounting to ₹91.45 crore of 14.68 lakh farmers has been sent to insurance companies by all the Central Cooperative Banks by the month of December, 2020.

Self-employment Credit Card Scheme

Under this scheme, loan amount of ₹50,000 for the term of 5 years is provided for non-agricultural activities.

Women Development Loan Scheme

Land Development banks through Women Development Loan Scheme are creating sources of income for women by providing loan of 50,000 for non-farming purposes and dairy business through guarantee of 2 persons, even without security of agricultural land. In the year 2020-21, a total loan of 10.72 crore was distributed to 385 women under this scheme.

Co-operative Farmer's Welfare Scheme

Co-operative Farmer's Welfare Scheme has been started by State Government through Central Cooperative Banks (CCBs) branches and Primary Agricultural Credit Societies (PACS) to meet agricultural credit requirements of farmers along with crop loan requirements.

As per the scheme, CCBS provide maximum loan amount of 10.00 lakh for agricultural and allied agricultural purposes.

Jan Aaushadhi Kendra

200 Jan Aaushadhi Kendra will be established by CONFED under Pradhan Mantri Jan Aaushadhi project. Presently Jan Aaushadhi Kendras are being operated in Udaipur, Jodhpur, Jhunjhunu and Dungarpur by Districts wholesale consumer stores and in Jaipur by CONFED. One Jan Aaushadhi Kendra is being operated by CONFED at SMS hospital Jaipur and one medicine selling centre is also being opertaed in Santokba Durlabhji Memorial Hospital (SDMH) Jaipur.

Cooperative Marketing Structure

There are Kraya Vikraya Samities at every mandi yard in the State and at apex level, **RAJFED** is functional. They are working to make available high yielding variety of seeds, fertilizers and pesticides to the farmers at fair prices and ensuring fair prices to the farmers for their crops.

Co-operative Consumer Structure

To resuscitate the consumers from black marketing and simulated deficiency in the market, cooperative institutions are working effectively in providing consumer products on reasonable prices. For this purpose, 37 cooperative wholesale bhandars are working at district level and Rajasthan Rajya Sahkari Upbhokta Sangh Ltd (CONFED) is working as Apex institution in the consumer sector.

Co-operative Housing Scheme

The main objective of Rajasthan Co-operative Housing Federation established in 1970 is to provide long term loans to members of housing societies/ Primary Agriculture Credit Societies (PACS) for construction of houses and providing house on cheap rates by developing well planned colonies.

Presently, after amendment on 4th November, 1996 in bye-laws of Rajasthan Co-operative Housing Federation (RCHF), personal housing loans are given to applicants after making them nominal member.

Co-operative Press

Rajasthan state co-operative printing press is an apex institution. The objective of this institution is to provide qualitative printing material for government department, members and non-members of co-operative societies.

Urban Co-operative Banks

33 Urban Co-operative Banks are functioning in the State. Among them, 3 banks are Railway Employee Salary Earner Co-operative Banks and 6 banks are women urban co-operative banks.

Cooperative Storage

There are 8,522 finished godowns under co-operative societies/ institutions. These godowns are used for agricultural produce, Public Distribution System (PDS) and food storage under various schemes of Rural Development Department.