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A Study of Sidhmukh Canal and Cropping Pattern in Bhadra Tehsil of Hanumangarh district of Rajasthan

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Introduction

On October 5, 1989, the foundation stone of the Sidhmukh Canal project was done by Rajiv Gandhi from Bhirani village near Bhadra. The use of water in addition to Ravi Vyas Rivers was to be taken.

For this, a canal of 275 kilometers of Bhakhra main canal was got out. The project received financial support from the European Economic Community. With this project Nohar, Bhadra in Hanumangarh district and Taranagar, Rajgarh tehsils in Churu district taking benefits of irrigation water and drinking water.

This project was inaugurated by Mrs. Sonia Gandhi on July 12, 2002. Water for this project has been brought from Bhakhra Nangal head work.

Sidhmukh project area is part of Indian Thar desert in North-West Rajasthan, which is adjacent to the existing Bhakhra Command and covers Nohar and Bhadra Tehsils of Hanumangarh district and some part of Rajgarh and Taranagar Tehsils of Churu district.

Rajasthan was allocated 8.60 MAF of surplus Ravi-Beas waters in an agreement signed by Chief Ministers of Punjab, Haryana and Rajasthan states on 31.12.1981 at Delhi.

Total Irrigated area in Bhadra Tehsil by different Canals:-

1. Irrigated Area by Bhakhra Canal – 60043 Hectares
2. Irrigated area by Sidhmukh Canal – 91110 Hectares
3. Irrigated area by IGNP – 2571 Hectares
4. Un Irrigated area – 19966 Hectares

- 173690 Hectares

Sidhmukh Canal catchment area divided in four geo circle in Bhadra tehsil

1. Dungrana geo circle area - 34915 Hectares
2. Ajitpura geo circle area - 34548 Hectares
3. Bhadra geo circle area - 10959 Hectares
4. Bhirani geo circle area - 10688 Hectares

- 91110 Hectares

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Number of Villages to be benefited under Sidhmukh Irrigation Project:-

The Sidhmukh Irrigation project divided in three parts, these are

1. **Raslana Distributary System under Villages 57**
2. **Sidhmukh Distributary System under Villages 25**
3. **Ratanpura Distributary System under Villages 13**

Physiographic of Study Area

The Hanumangarh district was formed on 12.07.1994 from than Sri Ganganagar district as 31st district of Rajasthan state. Seven tehsils of Sriganganagr district of Bikaner division viz. Sangria, Tibi, Hanumangarh, Pilibanga, Rawatsar, Nohar and Bhadra was included into the newly created district of Hanumangarh. The district headquarter Hanumangarh is situated on the bank of Ghaggar river Saraswati. Ghaggar river, which is called as 'Nali' in local dialect divides the district headquarter into two parts. In the north of Ghaggar river, Hanumangarh town and in the south the habitation of Hanumangarh junction is situated.

Sidhmukh Irrigation Project at a Glance

Sidhmukh Irrigation project envisages construction of canal system for providing irrigation to CCA of 86209 hectares (212936 acres) of fertile desert areas in Nohar & Bhadra tehsils of Hanumangarh district and Rajgarh and Taranagar tehsils in Churu district. Water for this project would be available from Rajasthan share in Ravi-Beas & Sutlej waters Rajasthan has shared 15% cost of irrigation component of Beas - Sutlej link project and accordingly entitled to get 0.47 MAFt out of total 3.82 MAFt of water diverted into Bhakra Dam through Beas-Sutlej link. Sidhmukh irrigation project would utilize 0.33 MAFt out of 0.47 MAFt of water allocated by the Government of India vide their order dated 15.01.1982. The supplies would be delivered to Rajasthan at FSL 687.50 at Rajasthan – Haryana boundary at the tail of Kishangarh link. These would be carried from Nangal head works through the Bhakra main line in Punjab and Fatehabad branch and Kishangarh sub-branch in Haryana. The channel in Haryana would be remodeled for carrying the additional supplies required for Sidhmukh project. A new 20 km. long canal named "Sidhmukh Feeder" will be constructed in Rajasthan territory along Amar Singh sub branch and Jhansal distributary to deliver the supplies for Sidhmukh project near village Bhirani from where the irrigable area starts and two distributries viz. Raslana and Sidhmukh off take.

In Rajasthan, two distributary systems namely Raslana and Sidhmukh distributary, off taking from the tail of Sidhmukh Feeder coming enroot Amar Singh sub branch and Jhansal distributary area will be constructed. The total length of new lined channels on the Sidhmukh Feeder would be 315 km.

The project area on full development would annually irrigate 33620 hectares (83041 acres) 39% intensity. The Rabi and Kharif intensities would be 12% and 27% respectively. Water allowance of the project has been kept as 2.70 cusecs per 1000 acres CCA at outlet head.

The main crops under irrigated agriculture would be Cotton during Kharif and Wheat in Rabi. Total cost of Sidhmukh irrigation project is rs. 4912.6 lacs.

The Sidhmukh irrigation project would provide irrigation to a culturable area of about 212936 acres (86209 hectares) of desert areas of tehsil Nohar and Bhadra in Hanumangarh (former Sri Ganganagar) district and Rajgarh, Taranagar tehsils of Churu district. The project area would cover 53 village of tehsil Bhadra and 20 villages of tehsil Nohar in Hanumangarh (former Sri Ganganagar) district and 14 villages of tehsil Rajgarh and 2 villages of Taranagar tehsil of Churu district. List of the villages is given in Annexure. The project area lies south of the Bhakra command of Amarsingh sub branch system in Rajasthan and is adjoin boundary.

Topography

The entire command area is a part of the Great Indian Desert. The area consists of desert plains and dunes of low to medium eights. The plain area is generally flat. The base of this formed of river alluvium.

Water resources of the area

No source of water exists in the area; ground water available at uneconomical depths is mostly brackish, unsuitable for irrigation as well as drinking purposes. Rainfall in the area is scanty & gets absorbed & cannot be used.

Climate

The area commanded by this canal is a part of Great Indian Desert as stated above. It is characterized temperature, erratic and scanty rainfall and high evaporanspeiration. The data for Shri-Ganganagar located at a distance of about 200 kms North West of command area have been taken for average temperatures, relative humidity, wind speed and potential evaporanspeiration.

The hottest months are from April to September with peak temperature being in the months of May-June when the mean maximum temperature vary from 41.58 to 42.10^{0}c. The mean minimum temperature is normally recorded in the month of January which is about 5^{0}c.

The relative humidity during the monsoon months is highest in august which are the rainiest month. Humidity in winter is moderately low.

The general wind direction in region is south west. The mean monthly wind speeds are given in Annexure -II-3. Storms are common during summer when hot winds prevail. Maximum number of dust storms occurs in June- July.

High value of potentio evaporanspiration indicates that the region is deficit in soil moisture. Rainfall hardly meets 10-15% of the difficult in the area and the rest has to be met by irrigation water. The extent of soil moisture deficit indicates roughly the requirement of irrigation water during different periods of the years.

Rainfall

The rainfall in this region is low and erratic. The rainfall occurs mainly during July-September. The rainfall various widely from year to year. The rainfall in the area falling in Bhadra and Nohar tehsils of Hanumangarh (former Sri Ganganagar) districts of various from 110 mm to 887 mm with average of 372mm. This statement indicates that due to poor and erratic rainfall, even drinking water is not available for several months during summer.

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Collection of water in depressions is also not possible on account of high permeability of the soil.

Ground Water

The ground water table is about 50 to 70 m deep. The water is available is mostly brackish and not suitable for human consumption. There is no scope of utilization of ground water in the area for irrigation and drinking purposes.

Soil

The base of this tract is formed of river alluvial and sand dunes lying over it give predominantly sandy character to the upper layer of the soil. Patches on the northern range of command area are less infested by dunes and contain fair percentage of loam. The sandy loam soils of these patches are very fertile and are capable to yield good crops of cotton and sugarcane if water is available. There is no evidence salinity of surface of soils which are permeable. A note giving preliminary classification of the soils of Shri Ganganagar district prepared by the joint director, agriculture (soil survey), Rajasthan is enclosed as annexure II-5.

Flora and Fauna

The project of area is put to only barani (rainfed) agriculture as there is no source o irrigation. The main crops grown in Kharif are Bajra, gawar and pulses while gram mustard and wheat are main Rabi crops, which are sown on small area. The dune area and areas around the villages are generally not cultivated and are use grazing. Desert bushes like Khimp and Phog grow in the uncultivated area, which are used for thatching and fuel respectively. Bhurat grass grows almost everywhere and is use as cattle fodder. Khejri, Jal, Ber and Kikar are the common trees.

Cattle, sheep and camels are an important part of the wealth of the agricultural population in the cropping and uncultivated tracts. They form the only source of income of the people living there. Cattle are healthy and large sized. The most well known breeds among cows is known as the Rathi. Each cow is capable of giving 5 to 6 kg. of milk at one time. Rajasthan has $1/5^{th}$ of the cattle wealth of India.

Land Use and Cropping Pattern

Under the pre project condition the command area is used for barani cultivation. In Kharif season the crops raised are Bajra, Gawar, Pulses and Fodder. In Rabi season Gram, Taramira and Mustard are grown. The Kharif area is about 70% of the total cropped area in a year, with every second year being a drought year. The yields are poor.

The present cropping pattern and produce before introduction of irrigation in the crop area is given as under:-

Sr. No.	**Crop**	**Area in Hectares/ 100 Hectare of cropped area**	**Average Produce in quintal/Hectare**
1	Bajra	6.2	3.0

2	Mixed Kharif Crops	15.9	3.0
3	Pulses	4.6	1.6
4	Gawar	42.9	3.0
5	Gram	26.5	6.9
6	Wheat and other Rabi Crops	4.9	3.0

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