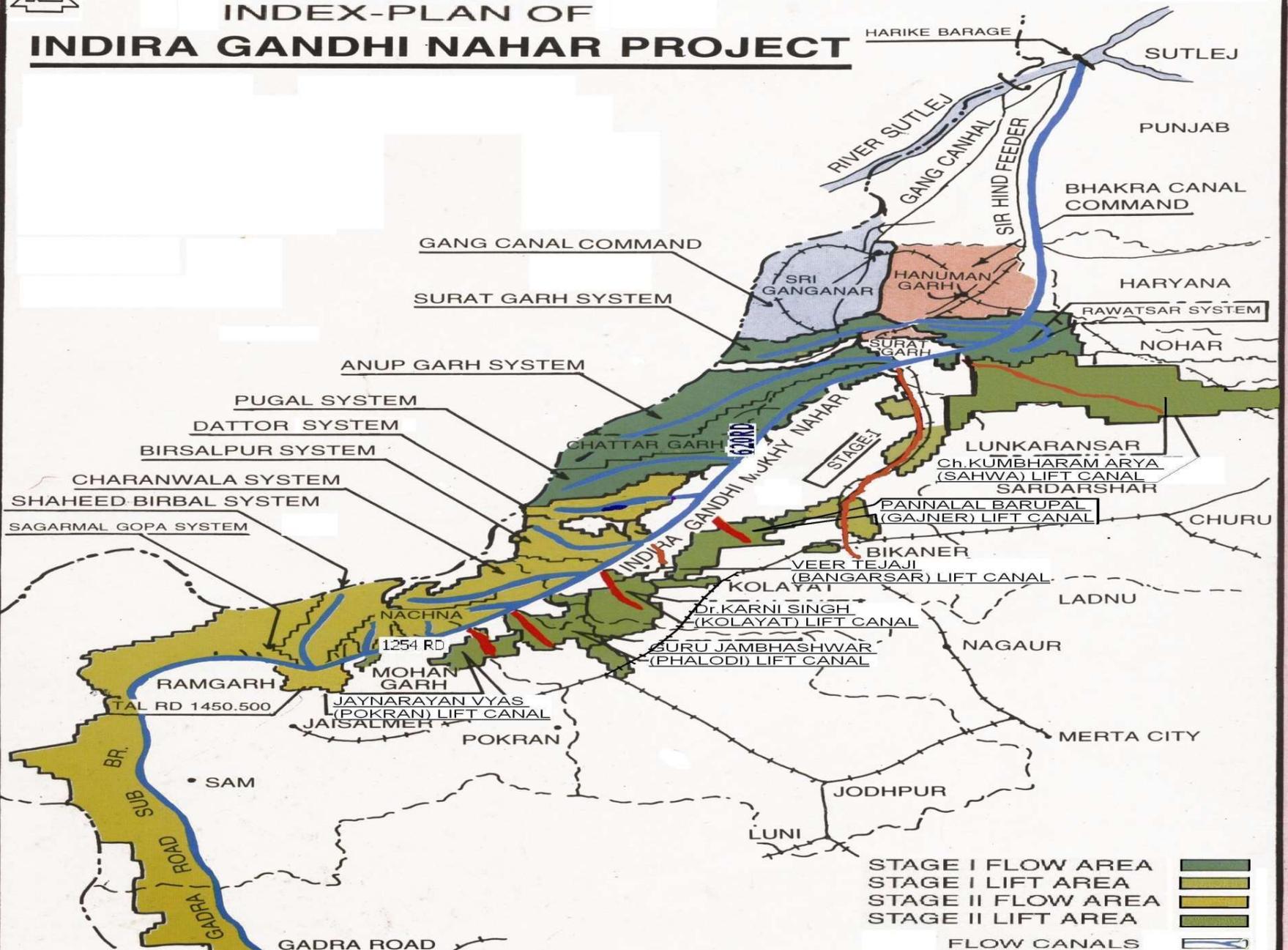


TRANSFORMATION OF WESTERN RAJASTHAN

INDIRA GANDHI NAHAR PROJECT



INDEX-PLAN OF INDIRA GANDHI NAHAR PROJECT



STAGE I FLOW AREA
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 FLOW CANALS

RAJASTHAN

- Rajasthan is the largest State of the country having more than 10.4% of the country's geographical area and 5.5% of the human population.
- Has only 1.16% of the total surface water available in the country and two- third area of the state is part of the Great Thar Desert
- Not long ago, the remote communities of western Rajasthan made a living from a single annual crop of bajra, which was dependent on the mercy of the rain Gods. Above 50-degree Celsius heat of the harsh summer sun, frequent sandstorms and water scarcity posed a major challenge for survival.
- Droughts and the spectre of camel and livestock bones strewn on the sand dunes loomed ahead.
- Source of drinking water was accumulated rain water in "Tanka" which was used for the whole year

IGNP- A Revolution

- Gang canal was the first initiative of canal irrigation in desert, taken by Maharaja Ganga Singhji of Bikaner State. The water from Sutlej river was brought to northern Rajasthan through this canal in 1927.
- After the success of Gang Canal, new Project was envisaged by Sh Kanwarsen, Chief Engineer of the erstwhile Bikaner State near about 1940.
- As per interstate agreement of 1955 between Punjab, Haryana & Rajasthan, 8.6 MAF out of 17.17 MAF surplus water from rivers Rabi and Beas was allotted to Rajasthan .
- Project was inaugurated by Sh. Govind Vallabh Pant, the then Home Minister of India on 30th March, 1958.
- Estimated cost of project is Rs. 6921 Crores and expenditure incurred up to March 2019 is about Rs. 5700 crores

SALIENT FEATURES OF IGNP

S.No	Particulars	Total
1	Water allocation for project	7.59 MAF
2	Off take of Indira Gandhi Feeder	Hairke Barage in Punjab
3	Length of Indira Gandhi Feeder	204 Km
4	Length of Main Canal	445 km
5	Culturable Command Area	16.17 Lac ha.
7	(i)Water allowance in (in cusecs/ th.acre)	5.23 & 3.0 (Flow), 2.0 (Lift)
8	i. Designed Capacity of Feeder canal at Harike	18500 cusecs
	iii. Designed Capacity of Main canal at tail	4810 cusecs
9	Length of canals in KM	8758
	(a)Flow area	6862
	(b)Lift area	1896

WATER REGULATION

- Normally all the canals of IGNP are clubbed in four groups out of these four groups, two groups are run at a time.
- Regulation changes after every 8.5 days and in case of water scarcity in the source dam, three groups are formed and one group is run for 8.5 days.
- Monitoring of water regulation is ensured through SCADA installed at all Cross and Head Regulator on Main Canal.
- Total allocation of water for non agriculture use is 0.875 MAF (1200 cusecs) at Harike.
- IGNP provides drinking water to 17.68 million urban & rural population in about 24 towns & 5300 villages of 9 districts -Hanumangarh, Sri Ganganagar , Churu, Jhunjhunu, Bikaner, Nagaur, Jodhpur, Jaisalmer and Barmer.

ON FARM DEVELOPMENT

- Water courses were constructed in 12 lac ha. area of flow command of IGNP since 1974 to 2010. Presently water courses are being constructed in an area of 4.45 lac ha in Gang, Bhakhra and Sidhmukh Nohar Projects under CADWM.
- Out of the above Gang Phase-II having area 0.45 lac ha. Has only been included in 99 priority projects, rest all projects are being executed by state funds.
- Sprinkler Irrigation as mode of OFD has been completed in Narmada Canal Project in an area of 2.40 lac ha.
- Similarly sprinkler Irrigation has been adopted as OFD works on Lift canals of IGNP in an area of 3.47 lac hectare, out of which 0.27 lac ha, has been completed in Pilot Project.

JOURNEY OF WATER FROM HIMALAYAS TO THAR



← Field water course

INITIAL PLANNING OF LIFTS

- The National Agriculture Commission in 1974 suggested that areas of Churu, Bikaner, Nagaur, Jodhpur, Barmer and Jaisalmer districts be provided irrigation facilities by constructing series of lift canals on the left bank in about 3.10 lac ha.
- A decision was taken in 1983 to include six lift schemes with a maximum Lift of 60 meters.
- Lift canals were constructed in between 1988 to 2008 with water allowance of 2 cusecs/1000 acres, it was not possible to irrigate the area by flow with such less water allowance hence sprinkler irrigation was adopted.
- As an initiation a **Pilot project** was taken up by the Department having an estimated cost of Rs. 83.10 crores for an area of 27449 hectare in all six Lift Systems during the year 2007-08. To access the results of Pilot Project **a case study was done on Tejpura** Minor



**SPRINKLER IRRIGATION IN
PILOT PROJECT AREA**

MI in TEJPURA Minor - CASE STUDY

Data Collection:-

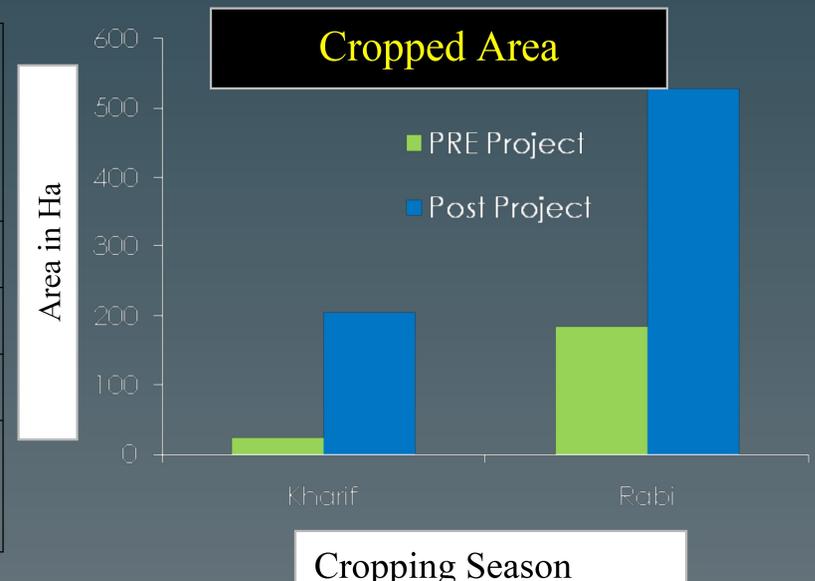
PRE & POST MICRO IRRIGATION ERA:

- Irrigation data of 5 years pre 2007-08 were collected of all the chaks of this canal representing the scenario of irrigation before inception
- Irrigation data of 5 years post 2012-13 after inception of sprinkler were compared.

RESULTS

1. Increase in Cropping area.

Crop Season in	Cropped area in Ha		Increase %
	PRE Project	Post Project	
Kharif	23.13	203.76	780.93%
Rabi	184.04	528.35	187.08%
Total	207.17	732.11	253.39%
Irrigation Intensity	11.5%	39.42%	253.39%



RESULTS OF TEJPURA CASE STUDY

SN	Particular	Unit	Pre MI	Post MI	Difference	Remarks
			Av. of 5 years data			
1	Command area under study in	Ha	1857	1857	-	No change
2	Cropped area	Ha	144.03	1111.12	671.51%	Increase in cropped area
3	Achieved Irrigation intensity	%	7.76%	59.84%		
4	Designed Irrigation Intensity	%	60%	60%	-	No change
5	Water applied	Mcft	111.76	145.3	30.01%	More
6	Delta	Meter	2.2	0.37	83%	Reduced
6	Water use efficiency	Ha/ MCM	45.51	270.08	493.42%	Increase in water application efficiency
7	Crop production	Rs in Lacs per ha.	0.35	2.15	514.29%	Increased crop production

ECONOMIC VIABILITY of Pilot Project

- Total cost of the M.I work on Tejpura Minor was Rs. 4.83 crore.
- After inception of sprinkler, increase in the irrigated area was from 144.03 Ha to 1111.12 Ha post 2012-13 i.e 967.09 Ha.
- With minimum support price annual production from one Ha is about Rs. 0.40 lacs, hence there was an increase in production by $967.09 \times 0.40 = 386.84$ lacs annually.
- It is quite evident that the cost of project was recovered in less than 2 years of its implementation.

NEED FOR ADOPTING MICRO IRRIGATION

- **Water Allowance in Stage II**

Water allowance in IGNP Stage I ranges from 5.23 cusecs/1000 Acre to 3 cusecs /1000 Acre whereas in Stage II, it is only 2 cusecs/1000 Acre which is insufficient to irrigate area using flow techniques

- **Increasing non irrigation water use**

With continuous increase in non irrigation water demand, availability of irrigation water is reducing with time. Thus only option for irrigation water lies in improving water use efficiency.

- **Improving Water Use efficiency**

Rajasthan State Water Policy stresses for encouraging for efficient water application and utilization practices. Adoption of micro irrigation methods is now mandatory in all irrigation projects.

SPRINKLER WORKS UNDER CADWM IN LIFT AREA

- Sprinkler works in six lift Schemes of IGNP were included in CADWM programme vide MOWR, GOI letter dated 18.03.2016 for an area of 3.20 lac hectare.
- The sanctioned cost of this project was Rs.1658.81 cr, which included 50% Central Share i.e. Rs. 829.40 cr.
- Works of pressure irrigation in command area of six lift Schemes were taken up after receiving an amount of Rs 10.85 cr as Grant Component of Central Assistance (CA) .
- Work orders for providing irrigation facility through sprinkler system in 1.67 Lac Ha command area for Rs. 723.48 cr were issued and works of pressure irrigation started in the field.

MICRO IRRIGATION IN REMOTE DESERT



VIEW OF LINED DIGGI TO IRRIGATE APPROXIMATELY 200 HACTARE OF LAND BY SPRINKLER, THIS DIGGI IS CONNECTED TO THE CANAL BY FEEDER CHANNEL



UNEXPECTED IMPEDIMENT

- It was informed vide MOWR, letter dated 13 July, 2017 that the IGNP Project could not be covered under 99 prioritized PMKSY projects therefore central assistance under CADWM program will not be available.
- It was advised by MoWR, to submit DPR of the project under new Scheme i.e. "Incentivisation Scheme for Bridging Irrigation Gap"(ISBIG).
- Accordingly DPR was submitted to CWC, Jaipur in October'17. which is under process in CWC, but no funds have yet been released by GOI so far.
- All works on lifts are in progress and an expenditure of Rs.18061 lacs has been incurred by state funds up to March 2019. State is not in a position to continue the project without financial support of GOI.

REHABILITATION OF IGNP

- The canal system is continuously serving for more than 50 years therefore it required rehabilitation works.
- Relining of Feeder in Punjab Portion has been sanctioned for Rs.1305 crore which shall be executed by Punjab Irrigation Department.
- The rehabilitation works amounting to Rs 3290 crore of Feeder and Head reach of Main Canal and distribution network have been taken up with the assistance of New Development Bank after approval from CWC.
- Another ERM Project amounting to Rs 1770 crore for Rehabilitation of Stage-II of IGMN is under sanction in CWC where micro irrigation has also been proposed in an area of 1.13 lac hectare in Jaisalmer Zone .

MAJOR REHABILITATION WORKS

- Repair of cross regulator at RD 496 and Relining of Feeder from RD 496 to 520 has been completed .
- Relining of Anoopgarh & Suratgarh Branch and other canals , Const. of Cross Regulator at RD 335 of IGMN are in progress
- During recent closure from 26.03.2019 to 24.04.2019 relining of IGF and IGMN was executed in a length of 22.7 km.
- **Benefits of Rehab works:-**
 1. Reduction in seepage losses and saving of 1200 cusecs of water.
 2. Approx 65000 hectare increase in cropped area.
 3. Surplus rain water at Harike can be used which otherwise goes waste.
 4. Reclamation of water logged area 33312 ha .

UNIQUE FEATURES of IGNP:

1. Murabbabandi

- The Land Holding of IGNP is in Squares called Murabbas (825' X 825') , further divided into 25 Bighas having each side of 165 feet.
- This procedure defines the exact situation of the land holding even to a small unit of Bigha and further to yet smaller units called biswas.
- This rules out any possibility of land dispute and facilitates smooth administrative control of the land holdings and irrigation.
- Water course or underground pipeline for water distribution is laid on the murabba line which is the boundary line between the two murabbas hence there is no dispute regarding the carrier channel .
- By establishment of murabbabandi , it becomes very easy to do Girdawri and prepare the demand of water charges to be collected from each farmer.

Contd....

2. Barabandi

- Barabandi is a composite sociotechnical and ethical system of rationing and sharing of water for irrigation.
- Judicious use of water resource is a prerequisite for enhanced productivity, improved economy and of critical importance when water supply is scarce.
- Farmers of a chak are provided water in proportion to their land holdings through this procedure.
- In Barabandi an order is issued by the irrigation authority in which water slip is provided to every farmer mentioning exact day and time of watering for his land.

DESILTING OF THE CANAL SYSTEM

- In western Rajasthan geographical condition is of sand dunes, high temperature and strong winds.
- The command of IGMN is mostly surrounded by vast sand dunes. In summer season blown sand from these dunes accumulates in the canals & water courses and creates hindrance in the water flow.
- An annual desilting of 14 lac cum is done by the Department from canals and almost equal quantity is desilted from water courses by farmers at their own cost before Rabi crops.
- Desilting of Main canal is a regular phenomenon which continues all the year round.



**DESILTING OF RUNNING CANAL BY DEPARTMENTAL
MIDDLE BOOM HYDRAULIC MACHINE**

IN THE END

- IGNP has definitely transformed the lives of millions of people living in the hot barren thar desert.
- Today an annual crop production worth Rs. 3800 crores is obtained by this Project.
- Supply of healthy drinking water has relieved millions of people of 9 districts from drinking high flouride ground water .
- Industries have been established along the canal, generating employment and productivity.
- Solar Power production units is another boon which have cropped up along the canal.

SHORT FILM ON REHAB WORKS



DESERT CONVERTED INTO GREENLAND

Thanks