

AN ANALYSIS OF THE IMPACT OF INDIRA GANDHI CANAL PROJECT ON IRRIGATION, AGRICULTURAL DEVELOPMENT AND LITERACY RATE IN JAISALMER DISTRICT

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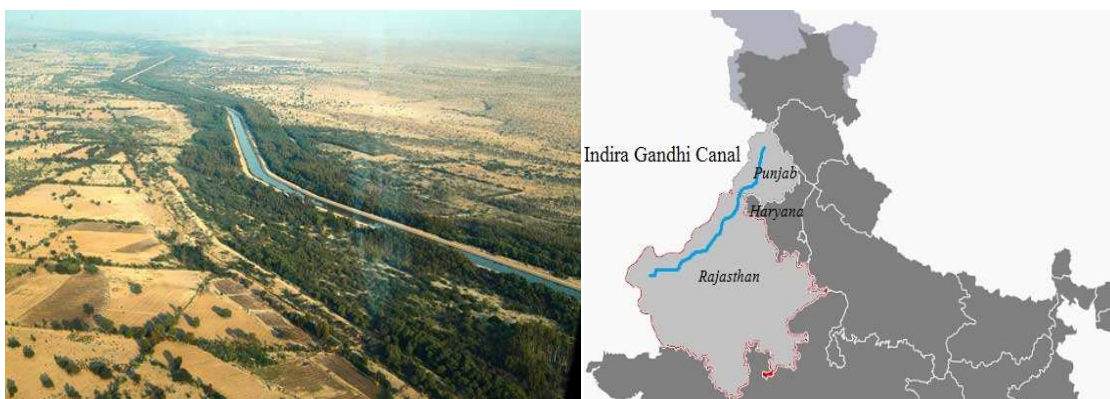
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Abstract: *The Indira Gandhi canal project has undergone a change in landscape, climate conditions, economic-social and environmental conditions of Jaisalmer district which is situated in the 'Thar' Desert of western Rajasthan, where there are unfavorable climatic conditions, with minor economic development, low population and population density, social and cultural diversity and thirsty for centuries, by the Indira Gandhi canal project in this region, the water coming and availability of water from the Himalayas have been possible. As a result, agriculture and irrigation facilities expanded and this region has immigrated, regional mixed culture, which has greatly affected the demographic formation and local human development. The objective of the study shows the change in the aftermath of the canal in the irrigation status, cropping pattern of major crops and literacy status of the district. Comparative study shows that in the past decades, there has been a positive change in agriculture area, production, productivity and irrigated area of kharif and rabi crops, education and literacy in the district. There has been astonishing positive change in the tehsils located in command area. While most positivity has been registered in some selected crops and girl child education, negativity is also visible in the tehsil situated far away from the irrigation facilities. The study refers to the major obstacles to irrigation agricultural development and education in the district, whereas the suggestion for promotion and advancement of education also suggests.*

Key words: IGNP, Irrigation, Agricultural development, Literacy, Impact analysis

Introduction

The Indira Gandhi canal project is an excellent example of the creativity generated by the untimely courageous straggle of man with the limitless inequalities of nature. As a lifeline of this desert, logging for water for centuries, this canal has set new records for all round development. In the Jaisalmer district, the Indira Gandhi canal project has changed a lot in social, economic and ecological form. Enhanced irrigation facility by canal system has encouraged immigration and has made changes in social and cultural forms along with literacy status. Different dimensions of human development, the area of agriculture, productivity and crop diversity has increased. Agriculture and Education is the basic medium of Human, socio-economic condition and country's advancement. This leads to development of human understanding and intellectual level, and it can become a participant in self and nation-building activities. Education is basis of human development which produces different types option, which is possible to achieve versatile and multilevel development and advancement and skilled manpower and resources are available to the country. The spread and availability of agriculture and education depend on the various favorable possibilities available in the state in which the population status and topography, per capita income, state conditions, government schemes and awareness and encouragement play an important role. Jaisalmer district is situated in the lap of the vast "Thar" desert in the western part of Rajasthan, when the main constraints in the spread and development of Education are not the ease and availability of the various schemes and programs with very strict-climate conditions, low population density, inaccessible terrestrial area, social status with ancient-belief and customs.



After the arrival of the Indira Gandhi canal Project, new population of farmers and agriculture Laborers has arrival from district and states with the development and expansion of irrigation facilities, agriculture and agro-cooperative activities. As a result of this, more than 150 new revenue villages have emerged in this barren and under Productive area and education and basic infra-structure are developing. The Indira Gandhi canal Project has made a positive impact on the economic and environmental status of this region, but it has also created a mixed culture due to its massive change in socio-cultural from. Traditional traditions and practices like the prevailing childhood slaughter and pardah tradition in this region of Rajput pluralism have not only changed the mixed culture of the canal command area, but have also oriented local society towards girl's child education. The study clarifies that out of total 04 tehsils of the district (Jaisalmer, Pokaran, Fatehgarh and Bhaniyana) Bhaniyana tehsil lacks irrigation facility and lack of immigration, hence the development of agriculture and education has decreased .While other canal irrigation facility tehsil are amazing in agricultural production and literacy increases have been recorded.

Study Area

Jaisalmer situated in the harsh desert area of the Thar Desert on the western shores of Rajasthan. Contained by the Yaduvanshi rulers, this district in spread over 38401 sq. Km area between 26⁰-29' to 28⁰-02' north latitudes and length of 186 km. and between 69⁰-29' to 72⁰-20' east longitudes and 720 km. width. According to the census year 2011 in the district the population is 669919 which are inhabited as 17 persons per square km. density. The administrative divisions are divided into 04 tehsils, 03 subdivision, 140 village panchayats and 840 revenue villages. Jaisalmer also has a unique identity in the field of tourism.

Objectives

The main objective of the research is to study the situation of irrigation facilities, crop pattern, area of agriculture, productivity and irrigated area of various crops and literacy status, the change in demographic, social and cultural from according to district and tehsil after the arrival of Indira Gandhi canal project .In particular, the tehsil located in irrigation areas and in tehsil of non-irrigation areas. Irrigation facility and agricultural development, rural-urban, Men-women and overall literacy, education status, development and future prospectus are studied.

Data base and Methodology

For the detailed study on the subject, annual progress reports of RSEB, Jaipur Rajasthan, agricultural statistics at a glance and vital agriculture statistics booklet, Rajasthan from 1994-95 to 2014-15. Jaisalmer's census report has been used since 1981 to 2011, published and unpublished data of office, district education officer (all) Jaisalmer, office of the assistant director economic and statistics, Jaisalmer has been used, simple statistical methods (percentage and average) and diagrams or mapping were used to synthesize these data.

Irrigation status of Jaisalmer

Desert condition of Jaisalmer district has been changed widely by Indira Gandhi canal project. For administrative control, Pokran tehsil of Bikaner irrigation division and remaining tehsils in the district and Sheo tehsil of Barmer district comes in Jaisalmer irrigation division, which is

expanded to 382 km. of the main canal to the distribution system of the last end (445 km.) According to the sources in the district, gross irrigation is most by the canal, the percentage of which was 84.49 in 1994-95, while the tube well was only 15.49 percent, which was 60.17 percent and 39.88 percent in 2014-15 after two decades. In 2015-16, the canal colonization area was 15.09 lakh hectares (11.23lakh hect. of Jaisalmer tehsil and 3.85 lakh hect. of Pokran tehsil) whereas it was lacking in Fatehgarh and Bhaniyana tehsil. According to 2016-17, the total canal command area in the district is 5.90 lakh hect., of which 5.18 lakh hect. (87.79 percent) has been developed and only 0.72 lakh hect. (12.21 percent) remains undeveloped.

Table 01: Canal command area (acc. sub-division), 2016-17 (in hect.)

Block	Total area	Developed area	Undeveloped area
Sam	228240	173056	55184
Jaisalmer	246168	246168	0
Sankra	116591	99069	17522
Total	590999	518293	72706

Source: Office, Chief engineer, IGNP, Jaisalmer

Impact of Irrigation on Cropping Pattern

After the arrival of the canal, increased irrigation facility has increased crop production and productivity. According to land use, in the year 1994-95, the net sown area of the district was 9.74 percent and the total agricultural area was 9.83 percent, which increased to 18.025 and 22.68 percent in 2014-15. With irrigation facility, there has been a surprising increase in select crops (gram, guar, cumin seed and Isabgol) in the decade of 2004-05 to 2014-15, the total area of cereals increased by 24.03 percent and irrigated area was 108.03 percent the most positive changes have been recorded in pulses, in which area has registered an increase of 726.05 percent, 560 percent in the production and 855.89 percent in irrigated area during the same period. In the irrigated area of food grains, oilseeds, and other classes, there has been an increase of 561.92 percent, 37.47 percent and 304.06 percent. However, negativity is also seen in productivity of some crops. The comparative study of the decade in the district shows that in the total agricultural sector, 199.78 percent increase, 84.72 percent of productivity and total irrigated area has increased by 219.63. Immigrant communities have made extensive social changes facilitate easy access to water, colonization expansion and agriculture and cooperative activities in the command area. There has been significant increase in literacy level and girl child education.

Table 02: Cropping pattern of Major Crops (2004-05 to 2014-15)

Total under Rabi & Kharif Crops	Year	Cereals	Pulses	Food grains	Oil seeds	Other	Total
Area (in hect.)	2004-05	110291	13986	124277	52178	226047	402502
	2014-15	83782	115532	199314	68478	616845	884637
	% Change	24.03	726.05	60.37	31.23	172.88	119.78
Production (in tones)	2004-05	15690	7638	23328	49602	9938	82868
	2014-15	15210	50411	65621	49148	38312	153081
	% Change	-3.05	560	181.29	-0.91	285.51	84.72
Productivity (Kg. /hect.)	2004-05	142	546	188	951	44	206
	2014-15	182	436	329	718	62	173
	% Change	28.16	-20.14	75	-24.5	40.9	-16.01
Irrigated Area (Area in hect.)	2004-05	7687	11869	19556	49140	26739	95435
	2014-15	15992	113455	129447	67557	108043	305047
	% Change	108.03	855.89	561.92	37.47	304.06	219.63

Source: Rajasthan agricultural statistics at a glance 2004-05 and 2014-15.

Challenges for Educational Development in the District

Jaisalmer district, like the analog of 'black water', there are few reasons for having low education levels and facilities

Wide Area, Remote and Dispersed Settlement

The district has the highest area (38401 sq.km.) in which only 17 people live per square kilometer. On the vast majority of district is the extension of the Thar Desert .it lacks basic facilities for teaching in marginal villages. Also there is not enough facility of transport and communication media.

Population Transfer

With the border areas, the main occupation of most of the rural areas in the district is animal husbandry and agriculture. In addition to irrigated areas, the effect of harsh climate on 'barani' agriculture (rain based) and animal wealth is reflecting in their transfer. Therefore, the task of connecting children with the main stream of education in the border areas is a challenge.

Seasonal Obstacles

The average annual rainfall in the district is 165 mm. it is clear that there is permanent habitation of famine and drought condition here. Summer high temperature (45-50) and in the month of May- June, the local super hot air 'lu' with dusty storms make condition worse and worse. Therefore, all kind of productive and personal work is affected.

Social Attitude

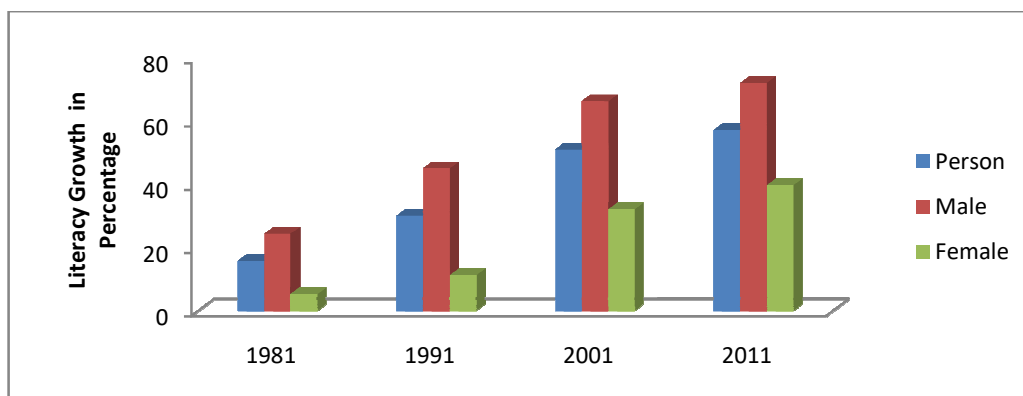
In the district, especially in Rajpoot dominated areas, 'pardah' costumes are still practiced. Therefore the mothers do not take interest in sending the girls to the school, but they understand their responsibilities in grooming the girls towards domestic task. As a result, enrollment of girls in school is very low and dropout is very high. For the postural in rural areas and by sending the children for the transfer of animals in dry and famine conditions, their stagnation in schools decreases.

Girl's education

In the absence of awareness and due to tradition, girl's education is more neglected in rural areas except urban centers. According to year 2015-16, there are only 04 government girls secondary and higher secondary schools in the district, only 75 schools are for girls, in which the number of primary schools is 02.this situation reflects the neglect of girl's child education.

Literacy Scenario

As per census 2011, the literacy rate of the district is 57.21 percent, which was 50.97 percent in 2001, a decade earlier. Male literacy in 2001 was 66.26 percent which increased to 72.03 percent in 2011, while female literacy was 39.71 percent, which was only 32.05 percent in 2001. There is 32.32 percent gender gap in the female male literacy in the district, so the district is so far behind in female literacy and comes in 'dark zone'.



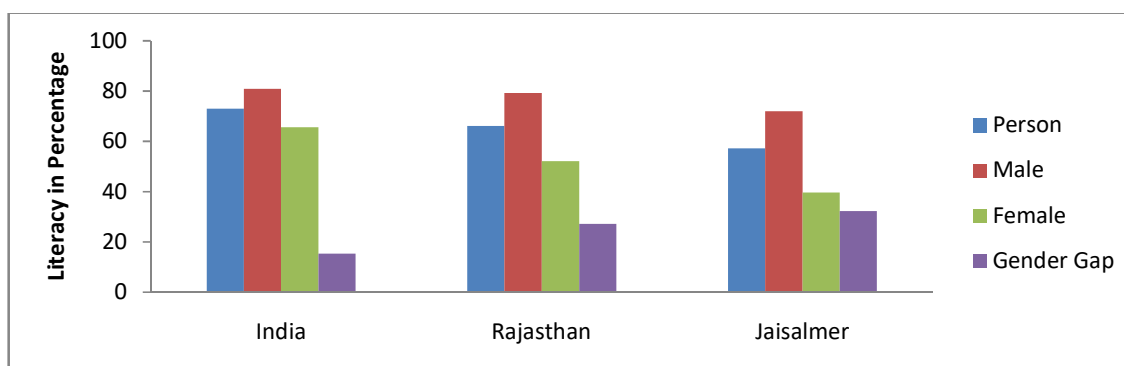
Comparative Study: Based on State and National Average

Comparison of literacy rate with state and national average, the district shows that the state average is 66.1 percent to 09.79 percent and the national average is 73 percent to 15.79 percent behind. Jaisalmer in male literacy, the state average is 79.2 percent to 07.17 percent and the national average is 80.9 percent to 08.87 percent backward. The female literacy rate of the district is 39.71 percent this rate, the female literacy rate of the state is 52.1 percent to 12.39 percent and the national female literacy rate is 25.89 percent lower than 65.6 percent.

Table 03: Literacy Rate (in percentage)

level	Person	Male	Female	Gender gap
India	73	80.9	65.6	15.3
Rajasthan	66.1	79.2	52.1	27.1
Jaisalmer	57.21	72.03	39.71	32.32

Sources: Census of Jaisalmer, Rajasthan and India, 2011



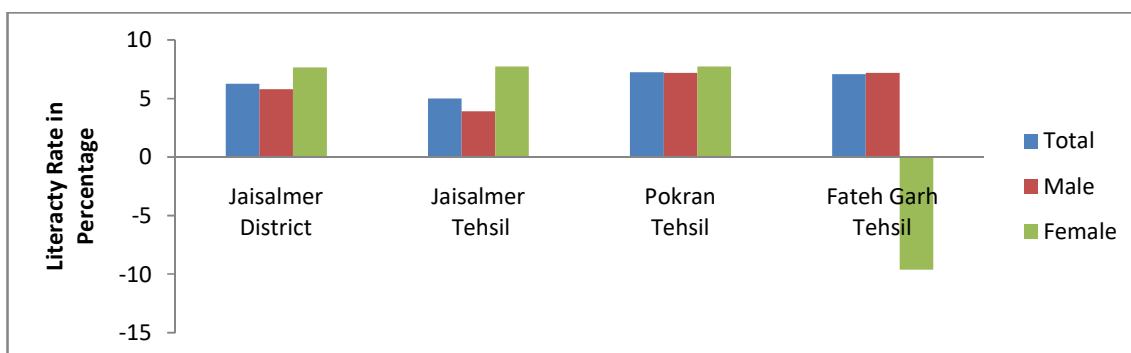
Comparative Study: On the Basis of District and Tehsil Average

Jaisalmer district comes in hard core and dark zone due to literacy, which is mainly due to lack of population and its scarcity as well as due to adverse environmental conditions, the speed of social and economic development is very low. However, according to the census of 2001 and 2011 in the district, there has been a surprising increase in the literacy rate of tehsil situated in canal irrigated areas.

Table 04: Literacy Rate, Rural-Urban (in percentage)

Dist./Teh.	Year	Total			Male			Female		
		Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
District Jaisalmer	2001	46.78	73.01	50.97	62.71	84.49	66.26	27.26	58.1	32.05
	2011	53.8	78.02	57.22	69.42	87.44	72.04	35.54	66.17	39.71
	Difference	7.02	5.02	6.25	6.71	2.95	5.78	8.28	8.07	7.66
Tehsil Jaisalmer	2001	46.58	74.87	54.88	62.55	85.49	69.31	25.53	60.71	35.81
	2011	53.35	78.46	59.88	68.23	87.1	73.23	35.39	67.44	43.54
	Difference	6.77	3.59	5	5.68	1.61	3.92	9.86	6.73	7.73
Tehsil Pokran	2001	46.64	67.15	48.42	62.43	81.19	64.08	28.24	50.41	30.14
	2011	53.79	73.79	55.68	69.7	88.42	71.29	35.74	62.68	37.88
	Difference	7.15	6.64	7.26	7.27	7.23	7.21	7.5	12.27	7.74
Tehsil Fatehgarh	2001	47.63	0	47.63	63.8	0	63.8	44.92	0	44.92
	2011	55.71	0	54.71	71.01	0	71.01	35.28	0	35.28
	Difference	7.08	0	7.08	7.21	0	7.21	-9.64	0	-9.64

Sources: Census report of Jaisalmer (2001 & 2011) Office, District education officer (all) Jaisalmer (Rajasthan)



In Jaisalmer district, the total literacy in the year 2001 was 50.97 percent, which was 52.22 percent, in 2011, with 06.25 percent changes, whereas in the district, there was an increase of 07.02 percent in rural literacy and 05.02 percent is urban literacy. The total male literacy gap in decimal interval is 05.78 percent, whereas, the difference in female literacy is 07.66 percent, which reflect growth. Urban literacy change in male literacy has improved 06.71 percent in rural areas compared to 02.95 percent, while female literacy is 08.28 percent increase in rural areas and urban literacy rate is 08.07 percent which is more than male literacy increase. Most decade of literacy change has come in rural female literacy which reflects the positive social change in the district and awareness of girl child education. According to the tehsil, the study clarifies that the total decade change in Jaisalmer tehsil is 05.00 percent, which is less compared to other tehsils. The urban literacy rate here is 03.59 percent, whereas in rural areas this increase has been almost double to 06.77 percent from urban areas, male literacy in Jaisalmer tehsil increased by 03.92 percent whereas female literacy recorded an increase of 07.73 percent. Increase in male literacy in urban areas increased to 01.61 percent, whereas in rural areas the rate increased to 05.68 percent, while in urban literacy, the urban literacy rate was 06.73 percent, whereas in rural female literacy, the district recorded the highest and most notable growth of 09.86 percent have occurred.

In Pokran tehsil, the total literacy gap in census 2001 to 2011 stands at 07.26 percent which is highest in the growth rate of district and other tehsils In addition, this tehsil is number one in rural literacy with 07.15 percent and urban literacy 09.64 percent with positive change. Male literacy rate in Pokran tehsil was 07.21 percent whereas the difference between rural and urban male literacy was 07.27 percent and 07.23 percent highest, at the same time, the decadal change in overall female literacy was 07.74 percent, with a change of about 12.27 percent in urban female literacy rate in place of a 07.5 percent change in rural female literacy. Fatehgarh tehsil, which was directly un afforded and low immigration from the Indira Gandhi canal project had a change in the total literacy of 07.08 percent Most of the population here, resides in villages. The decade of rural literacy in rural areas is also 07.08 percent. This change in male literacy shows negative change of 09.64 percent in 2011 compared to census 2001, which is a worrying condition.

Conclusion and Suggestion

The study clarifies that positive change has been recorded in agriculture area, production and irrigated area of cereals, pulses, food grains, oil seed and other crops under rabi and kharif, literacy rates in Jaisalmer and Pokran tehsil and Jaisalmer district which are situated in canal irrigated area, in particular, female literacy has been the highest increase in rural areas, whereas in areas far away from the canal and Fatehgarh tehsil, the female literacy of 09.64 percent has been marked in the negative. It is clear that cultural consolidation and mixing in the canal command area have made local customs a little flexible, while collective imitation and awareness has changed the mindset of killing the girl during birth, and there is also a positive trend of public opinion towards girls child education. The spread of education in district and canal command areas is really a challenging task, the main reason being the scattered population in the broad, inaccessible area. Literacy can be increased by conducting activities as per the following in the tehsil and villages in the plurality of sand dunes located in Jaisalmer district and Indira Gandhi canal command area.

- By putting non-residential camps for men and women.
- Education by mobile education unit for remote sandy areas.
- By creating professional training camps for creating interest in literacy and self employment.
- Organizing special education camps for women and girls.
- Nightclub classroom for the 'jogi' and 'bhil' community and teaching by the mobile education unit.
- Establishment of primary schools and conducting girl's school so that the gender gap can be reduced.
- Establishment school pyramid (from primary to higher secondary) according to the ideal location.
- Any additional benefits such as marginal allowance should be given to teachers appointed in the sanctioned schools.
- The accountability of the teachers and institution heads is fixed for the children's stay in school.
- Promoting of establishment of private educational institutions in the border and inaccessible areas should be encouraged.
- Residential building for the teachers stay and hostels for scheduled castes and scheduled tribes will be established.
- For the development of negative thinking towards child marriage and promoting education, the responsibility should be given to the patwari, ANM, village secretary and heads of the educational institution.

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