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Decadal growth of irrigation in Jalpaiguri district

Goutam Kundu

Researcher

Bardhaman University

Bardhaman

Abstract

Successful agriculture operation in West Bengal however, is still being dependent on the single most dominant climatic parameters i.e. rainfall. But even that rainfall though copious, is characterized by seasonal concentration, uncertainty and variability. The ground water resource of any territory is significant from two considerations. One of them is utilization in irrigating crops and another is for drinking water. In our analysis the focus of attention is on the compares the irrigation condition and growth within one decade in jalpaiguri district.

Key words: 1.Irrigation, 2.Development, 3.Growth, 4.Jalpaiguri, 5.Rainfall.

Objectives

Rainfall in the area follows the typical monsoon patterns. It occurs mostly during the four months. Sometime the monsoon being later and ends earlier and is also less certain and less uniform. The present study has undertaken to fulfill the following objectives –

- Discuss the irrigation condition during the period 1997-1998.
- Discuss the irrigation condition during the period 2007-2008.
 - Compare the growth of irrigation within one decade.

Database

The information and data collected mainly from four secondary sources, such as 1.F. John Grunning (2008) :Eastern Bengal And Assam District Gazetteers ,Jalpaiguri 2.Bureau of Applied Economics & Statistics ,Government of West Bengal (2008):District Statistical Handbook ,Jalpaiguri. 3 Bureau of Applied Economics & Statistics, Government of West Bengal (2002): District Statistical Handbook, Jalpaiguri.

Methodology applied in the study are totally depends statistical analysis by tables, charts, interpretation, projection. Some basic information are taken from internet and few literature have been studied for prepare the papers.

Study area

The study area comprises districts of Jalpaiguri, west Bengal bounded by the latitude of 26° 16' to 27° 13' North and the longitudes of 87° 59' to 89° 53' East. The region covers an area 6227 sq.km. This is 10.56% of the total geographical area of the state and inhabited by 3869675 persons (2011).The district situated in the northern part of West Bengal has international border with Bhutan and Bangladesh in the north and south respectively and district borders with Assam and the Darjeeling hills in the east, west and northwest.

Introduction

Successful agriculture operation of any region is dependent on water availability of the region. Water may be available to crops in the natural course by rainfall or it may be supplied to the agriculture fields artificially by human efforts. The process of supplying water to crops by artificial means such as canals ,wells,tube-wells,tanks,etc.from the sources of water such as rivers, tanks ,ponds or underground water is called irrigation (Khuller,2007).The geographical conditions, especially the nature of monsoon rainfall in India make irrigation indispensable for sustainable agriculture development. Unfortunately, rainfall in India is uncertain, unreliable, irregular, variable, seasonal and unevenly distributed. The main rain bringing south-west monsoon often fails to keep its date. It may come either before or after the scheduled date of arrival. Normally speaking, the rainfall keeps its date of arrival and withdrawal only in one out of five years. The amount of rainfall may also vary greatly from the normal. Excess rainfall may cause floods but less rainfall forces the farmers to resort to irrigation. Ironically, the variability of rainfall is very high in areas of low rainfall.

The study area experience five dominant seasons but their duration and extent are not similar. Rainfall in the area follows the typical monsoon pattern. It occurs mostly during the four months from May to mid September and is followed by prolong dry seasons. Certain geographical factors have helped in irrigation in different parts of India. The northern plain of India has extremely rich fertile soils deposited by the mighty rivers following from the Himalaya range. The slops of land are so gentle that canals can carry the irrigation water to far off places. The soft and friable nature of the soil makes it easy to dig canals and to sink wells. There is thus, a large quantity of ground water which is taken out for irrigation through wells and tube wells. The area is blessed with a large number of perennial rivers which provide water for irrigation throughout the year. Sources of irrigation are used depending upon the topography, soil, rainfall, availability of surface or ground water, nature of rivers (whether perennial or non perennial) and requirements of crops etc. The main sources used in different parts of the country are 1.Canals 2.Wells and tube wells 3.Tanks and 4.Other (Dongs, Kuhls and Spring etc.). Jalpaiguri is in the foothill region of Himalayas due to this, the district is blessed by many big perennial rivers .Here canal irrigation is well developed with some tank irrigation. Teesta low dam project is one of the canal irrigation of this district.

Discussion

The compare of district level growth of irrigation can be discussed with the irrigation statistics of 1997-1998 and 2007-2008 from District Statistical Handbook. The distribution pattern reflects the potential reserve and difficulties attending to their utilization and also the level of agriculture development attained. Irrigation cover area of the

district is increasing from 1997-1998, now it is 111.75 thousand hectares (2007-2008). The overall growth from 1997-1998 is 49.83 percent.

Year wise area irrigated by different sources and year wise source of irrigation by different sources has been stated in table 1&2. Table shows that area under irrigation is highest in the year of 2004-2005 (116.16 thousand hectares). It has recorded lowest in the year 1997-1998 (55.69 thousand hectares). Overall growth of irrigation during the decade is near about 50%. Average growth of one year is more & less 10 thousand hectares. Irrigated area during the period 2003 to 2004 decline (94.28 thousand hectares to 84.69 thousand hectares) but next year it is jump from 84.69 thousand hectares to 116.16 thousand hectares that is 27 percent growth. It has stated that the district is pronounced by many perennial rivers from all direction that sway growth of canal irrigation is high compare to other irrigation system. The district is absent by MDTW and LDTW. Area under River Lift Irrigation system is increasing from 2.28 (1997-1998) to 11.26 (2007-2008) thousand hectares.

Table 2 shows that year wise source of irrigation by different sources in the district of Jalpaiguri. Source of irrigation by different sources is highest during the year of 2004-2005 (18425 no.) and lowest during the year of 1997-2000 (13960 no.). As whole the number of source of irrigation by different sources is increased from 2000 but in case of shallow tube well (STW) number is increased (1274 to 2592) during one decade. That is 50.82 percent of total number. If we see the statistics of Open Dug Well the number is rapidly grow from 271 to 3675 during the period of 2002-2003, that is 92.62 percent growth.

Block wise area irrigated by different sources during the year of 1997-1998, irrigated area is highest in Rajganj block (24567 thousand hectares), followed by jalpaiguri (17351 thousand hectares) and lowest in the block of Metiali (1270 thousand hectares), followed by Nagrakata 1635 thousand hectares. From table we can say that the district is influenced by canal and river lift irrigation (RLI), area irrigated by canal irrigation is highest in the block of Rajganj (22250) and river lift irrigation is highest in the block of Dhupguri (2240).

In 2007-2008 block wise area irrigated by different sources in the district of Jalpaiguri, the area under irrigation is highest in the block of Rajganj (25810 thousand hectares) followed by Jalpaiguri block (18866 thousand hectares). In this year open dug well (ODW) irrigation system is well developed with canal and river lift irrigation (RLI). Canal irrigation is highest in the block of Rajganj (22830 thousand hectares) due to the implementation of Teesta Barrage Project. River lift irrigation is highest in the block of Maynaguri (2060 thousand hectares), followed by Dhupguri block (1520 thousand hectares).

Source of irrigation by different sources in block of Jalpaiguri district during the period of 1997-1998 has been shown in table no.5. From the table, we see that highest number of source of irrigation is recorded in Maynaguri block (2897), followed by Falakata block (2720). Very poor condition of irrigation status is recorded in the Nagrakata (57), followed by Metiali (152) due undulation of relief. As whole in the blocks of Jalpaiguri shallow tube well system of irrigation is well establish. Highest is recorded at Dhupguri block. Other system of irrigation is well developed compare to Tank; Open dug well, River lift irrigation in the district.

Source of irrigation by different sources in block of Jalpaiguri district during the period of 2007-2008 has been shown in table no.6. From the table, we see that highest number of source of irrigation is recorded in Jalpaiguri block (2674), followed by Maynaguri (2589), Dhupguri (2542), Falakata block (2588). All of these blocks are influenced by Gajoldoba Teesta Low Dam Project. Very poor condition of irrigation status is recorded in the Nagrakata (57), followed by Metiali (288), Madarihat-Birpara (395), Kalchini (309) due undulation of relief and un fertile land. As whole in the blocks of Jalpaiguri Open Dug well (ODW) system of irrigation is well establish. Highest is recorded at Rajganj block (930), followed by River Lift Irrigation. Other system of irrigation is well developed compare to Tank; Open dug well, River lift irrigation in the district.

Conclusion and recommendation

The district is under developed in irrigation. In 2007-2008 total area under irrigation is only 17.85 percent of geographical area. Population is increasing, now population is 3,869,675 (2011) with 621 person /square km. There is little scope for extending of agricultural land and the impending necessity of meeting the ever increasing demand for food and the increasing demand from domestic, power, industrial, environment management, navigation and other factors, there will be increase of the utilization of the water resources of the district in near future.

The main features of the data and information can be summarized as follows:

1. During the period 1997 to 2007 the growth of canal irrigation and shallow tube well irrigation is good, but not satisfactory because of the area under canal irrigation is only 11.16 percent of total geographical area. It has stated that the district is cover by many perennial rivers, such as Teesta, Torsa, Jaldhaka, Sankosh, Raidak. The growth of River Lift Irrigation, Other system of irrigation is medium but Tank irrigation, High Capacity Deep Tube Well and Open Dug well irrigation growth is very low. Use of underground water and water use of river can change the condition, because the district has high potential water resource for irrigation compare to the other parts of the state.
2. Total number Source of irrigation from 1997 to 2007 has been increased 25.37%, this is not satisfactory, and it should be developed by proper management. Open Dug Well (ODW) irrigation system is well developed compare to other irrigation system; it has developed 92.76 percent within one decade. Number of Shallow Tube well (STW) and river lift irrigation (RLI) developed moderately but High capacity Deep Tube well (HDTW) number is decreasing. Tank irrigation has no change, whereas the district received adequate rainfall (2932 mm/year). By implementation of 100 days employment scheme of central government Tank irrigation can be developed.
3. Block wise growth of irrigated area is developed in Rajganj block and Jalpaiguri due to the Canal irrigation system of Teesta low dam project. Other blocks such as Maynaguri, Dupguri, Mal, Kumargram, Falakata, Madarihath- Birpara are still not developed. Metiali, Kalchini, Alipurduar I and II irrigation, Nagrakata status is poor due some unknown factors.

Source of irrigation number is good in the blocks of Rajganj, Jalpaiguri, Maynaguri, Dhupguri, Falakata, Alipurduar I&II compare to other blocks of Jalpaiguri districts because of the development of River Lift Irrigation, Open Dug Well, Shallow Tube Well irrigation. Mal, Kumargram, Madarihath-Birpara have moderate growth but very poor condition recorded in Metiali, Nagrakata, Kalchini block.

Table I
Year wise area irrigated by different sources in the district of Jalpaiguri

| Year | Canal | Tanks | HDTW | STW | RLI | ODW | Others | Total |
|-----------|-------|-------|------|------|------|------|--------|-------|
| 1997-1998 | 46.19 | 1.90 | 0.67 | 2.55 | 2.28 | 0.55 | 1.55 | 55.69 |
| 1998-1999 | 48.45 | 2.20 | 1.16 | 2.55 | 8.22 | 0.55 | 6.50 | 69.63 |
| 1999-2000 | 52.37 | 2.20 | 1.16 | 2.55 | 8.22 | 0.55 | 6.50 | 73.55 |

| | | | | | | | | |
|-----------|-------|------|------|-------|-------|------|-------|--------|
| 2000-2001 | 57.71 | 1.90 | 2.55 | 3.12 | 11.58 | 0.54 | 6.82 | 84.22 |
| 2001-2002 | 57.76 | 2.25 | 2.29 | 3.14 | 9.92 | 0.54 | 8.80 | 84.70 |
| 2002-2003 | 58.38 | 2.25 | 2.12 | 3.59 | 9.04 | 3.67 | 15.23 | 94.28 |
| 2003-2004 | 48.65 | 2.09 | 2.00 | 4.01 | 9.04 | 3.67 | 15.23 | 84.69 |
| 2004-2005 | 80.96 | 2.12 | 2.31 | 4.35 | 8.86 | 3.44 | 14.12 | 116.16 |
| 2005-2006 | 62.53 | 2.10 | 1.76 | 8.84 | 11.14 | 3.68 | 14.07 | 104.12 |
| 2006-2007 | 69.53 | 2.12 | 1.14 | 10.37 | 11.26 | 3.68 | 13.65 | 111.75 |

Source – District Statistical Hand book 2002 and 2008

Table II
Year wise source of irrigation by different sources in the district of Jalpaiguri

| Year | HDTW | STW | RLI | ODW | Tank | Others | Total |
|-----------|------|------|-----|------|------|--------|-------|
| 1997-1998 | 58 | 1274 | 152 | 271 | 18 | 12187 | 13960 |
| 1998-1999 | 58 | 1274 | 152 | 271 | 18 | 12187 | 13960 |
| 1999-2000 | 58 | 1274 | 152 | 271 | 18 | 12187 | 13960 |
| 2000-2001 | 58 | 1564 | 193 | 271 | 18 | 15597 | 16291 |
| 2001-2002 | 58 | 1557 | 144 | 271 | 18 | 16308 | 18356 |
| 2002-2003 | 53 | 1796 | 278 | 3675 | 18 | 12345 | 18165 |

| | | | | | | | |
|-----------|----|------|-----|------|----|-------|-------|
| 2003-2004 | 50 | 1845 | 278 | 3675 | 18 | 12345 | 18211 |
| 2004-2005 | 62 | 2047 | 278 | 3675 | 18 | 12345 | 18425 |
| 2005-2006 | 44 | 2211 | 385 | 3675 | 18 | 11945 | 18278 |
| 2006-2007 | 44 | 2592 | 391 | 3675 | 18 | 11547 | 18267 |

Source – District Statistical Hand book 2002 and 2008

Table III

Area irrigated by different sources in the blocks of jalpaiguri for the year 1997-1998

| Sl.No. | Name of the blocks | Canal | Tank | RLI | DTW | STW | ODW | Others | Total |
|--------|-----------------------|-------|------|------|-----|------|-----|--------|-------|
| 1 | Rajganj | 22250 | 150 | 560 | 205 | 122 | 80 | 1200 | 24567 |
| 2 | Jalpaiguri | 14000 | 250 | 960 | 800 | 352 | 84 | 905 | 17351 |
| 3 | Maynaguri | 1600 | 300 | 1680 | 400 | 620 | 108 | 1075 | 5783 |
| 4 | Dhupguri | 3020 | 300 | 2240 | 320 | 266 | - | 1064 | 7708 |
| 5 | Mal | 2200 | 100 | 760 | 40 | 1000 | - | 300 | 3666 |
| 6 | Metiali | 1000 | 100 | 20 | - | - | - | 150 | 1270 |
| 7 | Nagrakata | 1400 | 100 | 80 | - | - | - | 55 | 1635 |
| 8 | Kumargram | 1000 | 125 | 260 | 40 | 120 | 42 | 564 | 2151 |
| 9 | Falakata | 3000 | 200 | 1600 | 164 | 132 | 28 | 345 | 6610 |
| 10 | Madarihat -Birpara | 3540 | 300 | 1020 | 160 | 252 | 32 | 730 | 5068 |
| 11 | Kalchini | 1350 | 50 | 160 | - | - | - | 292 | 1763 |
| 12 | Alipurduar 01 | 2000 | 300 | 1020 | 160 | 252 | 32 | 1152 | 3985 |
| 13 | Alipurduar02 | 1400 | 175 | 100 | 40 | - | - | 203 | 3151 |

Source – District Statistical Hand book 2002

Table IV
Area irrigated by different sources in the blocks of jalpaiguri for the year 2007-2008

| Sl.No. | Name of the blocks | Canal | Tank | RLI | DTW | STW | ODW | Others | Total |
|--------|-----------------------|-------|------|------|-----|------|-----|--------|-------|
| 1 | Rajganj | 22830 | 130 | 420 | 80 | 320 | 930 | 1100 | 25810 |
| 2 | Jalpaiguri | 14000 | 280 | 780 | 260 | 2036 | 260 | 1250 | 18866 |
| 3 | Maynaguri | 1600 | 350 | 2060 | 300 | 2148 | 180 | 1675 | 8313 |
| 4 | Dhupguri | 3020 | 320 | 1520 | 220 | 2244 | 190 | 1560 | 9074 |
| 5 | Mal | 2240 | 120 | 1160 | 40 | 824 | 250 | 570 | 5204 |
| 6 | Metiali | 1000 | 25 | 540 | - | - | 160 | 480 | 2205 |
| 7 | Nagrakata | 1400 | 20 | 240 | - | - | 55 | 500 | 2215 |
| 8 | Kumargram | 1000 | 125 | 520 | 40 | 320 | 280 | 1400 | 3685 |
| 9 | Falakata | 3000 | 250 | 980 | 80 | 1196 | 340 | 1439 | 7285 |
| 10 | Madarihat -Birpara | 3540 | 50 | 720 | - | 136 | 300 | 1200 | 5946 |
| 11 | Kalchini | 1350 | 50 | 340 | - | - | 180 | 480 | 2400 |
| 12 | Alipurduar 01 | 2000 | 225 | 880 | 80 | 436 | 200 | 1400 | 5221 |
| 13 | Alipurduar 02 | 1400 | 175 | 1100 | 40 | 708 | 350 | 600 | 4373 |

Source: District Statistical Hand Book 2008

Table V
Source of irrigation by different sources in the blocks of Jalpaiguri for the year 1997-1998

| Sl.No. | Name of the Block | RLI | DTW | STW | ODW | Tank | Other | Total |
|--------|-------------------|-----|-----|-----|-----|------|-------|-------|
|--------|-------------------|-----|-----|-----|-----|------|-------|-------|

| | | | | | | | | |
|----|-----------------------|----|----|-----|----|---|------|------|
| 1 | Rajganj | 9 | 5 | 61 | 40 | 1 | 1103 | 1219 |
| 2 | Jalpaiguri | 14 | 20 | 176 | 42 | 2 | 2379 | 2673 |
| 3 | Maynaguri | 36 | 10 | 310 | 54 | 3 | 2484 | 2897 |
| 4 | Dhupguri | 22 | 8 | 319 | 48 | 2 | 2298 | 2697 |
| 5 | Mal | 10 | 01 | 133 | - | 1 | 650 | 795 |
| 6 | Metiali | 1 | - | - | - | 1 | 150 | 152 |
| 7 | Nagrakata | 1 | - | - | - | 1 | 55 | 57 |
| 8 | Kumargram | 4 | 1 | 60 | 21 | 1 | 465 | 552 |
| 9 | Falakata | 16 | 4 | 74 | 19 | 1 | 2606 | 2720 |
| 10 | Madarihat- Birpara | 5 | 4 | 30 | 17 | 1 | 339 | 398 |
| 11 | Kalchini | 2 | - | - | - | 1 | 292 | 295 |
| 12 | Alipurduar1 | 10 | 4 | 66 | 14 | 2 | 1627 | 1723 |
| 13 | Alipurduar2 | 14 | 1 | 126 | 16 | 1 | 1860 | 2018 |

Source – District Statistical Hand book 2002

Table 6
Source of irrigation by different sources in the blocks of Jalpaiguri for the year 2007-2008

| Sl.No. | Name of the Block | RLI | DTW | STW | ODW | Tank | Other | Total |
|--------|-------------------|-----|-----|-----|-----|------|-------|-------|
| 1 | Rajganj | 7 | 4 | 80 | 930 | 1 | 255 | 1277 |
| 2 | Jalpaiguri | 15 | 13 | 509 | 260 | 2 | 1875 | 2674 |
| 3 | Maynaguri | 71 | 8 | 537 | 180 | 3 | 1790 | 2589 |
| 4 | Dhupguri | 56 | 8 | 561 | 190 | 2 | 1725 | 2542 |
| 5 | Mal | 46 | 1 | 206 | 250 | 1 | 725 | 1229 |
| 6 | Metiali | 27 | - | - | 160 | 1 | 40 | 228 |
| 7 | Nagrakata | 10 | - | - | 55 | 1 | 45 | 111 |

| | | | | | | | | |
|----|-----------------------|----|---|-----|-----|---|------|------|
| 8 | Kumargram | 20 | 1 | 80 | 280 | 1 | 400 | 782 |
| 9 | Falakata | 37 | 4 | 299 | 340 | 1 | 1907 | 2588 |
| 10 | Madarihat- Birpara | 30 | - | 34 | 300 | 1 | 30 | 395 |
| 11 | Kalchini | 13 | - | - | 180 | 1 | 115 | 309 |
| 12 | Alipurduar1 | 28 | 4 | 109 | 200 | 2 | 1330 | 1673 |
| 13 | Alipurduar2 | 31 | 1 | 177 | 350 | 1 | 1310 | 1870 |

Source – District Statistical Hand book 2008

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Abbreviation: DTW=Deep Tube well, STW=Shallow Tube well, HDTW=High Capacity Deep Tube Well, MDTW=Middle Capacity Deep tube Well, LDTW=Middle Capacity Deep Tube Well, RLI=River Lift Irrigation, ODW=Open Dug Well Other source=Dhngs, Khuls, Spring etc.