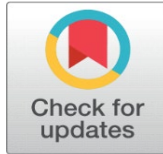
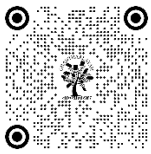


A STUDY ON THE POLICY IMPLEMENTED FOR THE GROWTH OF IRRIGATION IN ASSAM

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ABSTRACT

Irrigation is an important farm implement to increase the production of both kharif and rabi season crops. A study has been conducted to highlight the policies implemented in Assam to raise agricultural productivity and to examine the growth trends of irrigation facilities in the state. The result of study reveals that Irrigation Department of Assam has implemented several schemes sponsored by Central, State, and Institutional bodies. Through the utilization of Compound Annual Growth Rate analysis, the results indicate a notable increase in Gross Irrigated Area (GIA), Net Irrigated Area (NIA), Irrigation Potential Created (IPC), and utilization of major and minor irrigation systems, as well as season-wise irrigation facilities in Assam.

1. INTRODUCTION

Irrigation is the process of applying artificial water for the growth and development of crops. Wells, ponds, lakes, canals, tube-wells, and even dams are sources of water for irrigation. In an environment where global warming persists, ecological imbalances exist and erratic monsoons prevail, irrigation cannot be denied. Irrigation is important for sustaining agricultural productivity even in low rainfall during the monsoon season. Kumar et al (2021) concluded in their study that an increase in the net area irrigated by tube wells and other wells relative to the net sown area corresponded to higher cropping intensity and crop productivity during the study period. Pattanayak and Malick (2018) investigated the influence of irrigation on agricultural productivity in Odisha. Their findings underscored a positive correlation between irrigation intensity and agricultural productivity, emphasizing the pivotal role of irrigation in enhancing regional productivity. Adebayo et al (2018) found that the adoption of irrigation technology led to enhanced agricultural productivity and contributed to improved food security among smallholder farmers in Nigeria. During the monsoon, heavy rainfall causes extensive damage to summer and kharif crops. The cultivation of rabi crops not only provides an opportunity to increase rabi crop production but also reduces the burden of production loss of kharif season crops due to floods. Irrigation is also one of the important inputs for raising the production of rabi crops because it is

sown during drought (October to March). Goyari (2014) used field survey data to explore seasonal changes in irrigation facilities for summer paddy cultivation in Assam. The study found that the availability of short-duration paddy varieties enabled year-round cultivation, but only farmers with access to natural water sources or those who are able to afford artificial irrigation methods were cultivating summer paddy. Rahman and Pravin (2009) studied the expansion of irrigation areas over three decades and its impact on food grain production. Their analysis, based on time series data and various statistical methods, showed a strong correlation ($r=0.978$) between increased boro rice productivity and expanded irrigated areas. Specifically, for every hectare of expanded irrigation area, an additional 3.22 metric tons of boro rice were produced in Bangladesh.

Assam relies heavily on agriculture, with over 70% of its population depending directly or indirectly on the sector for their livelihoods. Agriculture in Assam is deeply impacted by the unpredictable monsoon. Excessive rainfall during this time often results in water logging and worsens flood situations, leading to considerable damage to kharif crops. To mitigate these losses, cultivating rabi crops becomes crucial during the dry season. Mechanization of agriculture and ensuring dependable irrigation are identified as crucial factors in enhancing productivity and sustainability during the rabi season. Consequently, the Irrigation Department of Assam was formed in 1974 with the objective of increasing irrigation intensity by ensuring water throughout the year and thereby encouraging multiple cropping. The Irrigation Department of Assam has adopted various Centrally Funded Projects, State Funded Projects, and Institutional Funded Projects for the growth of irrigation facilities in the state.

Objectives: The study is based on following objectives:

- i. To highlight the policies implemented for the growth of irrigation facility in Assam.
- ii. To examine the growth of irrigation facility in Assam.

2. DATA AND METHODOLOGY:

The study is mainly divided into two parts- first is highlighting the policies for the growth of irrigation facilities in Assam and second part is for examining the growth trends of irrigation facilities in Assam. The study is based on secondary data and is collected from Economic Survey of Assam (various issues), Statistical Handbook of Assam (various issues), books, journals and internet. The Compound Annual Growth Rate has been used to examine the growth trends of irrigation facilities in Assam.

3. RESULT AND DISCUSSION

i. Highlighting the Policies for the Growth of Irrigation Facilities in Assam

The Irrigation Department of Assam has adopted various Centrally Funded Projects, State Funded Projects and Institutional Funded Project for the growth of irrigation facility in the state. They are given below –

i.1. Accelerated Irrigation Benefit Programme (AIBP): Government of India launched Accelerated (AIBP) in the year 1996-97 to provide Central Assistance to States for the major/medium irrigation projects in the country, with the objective to accelerate implementation of advanced stage irrigation projects help up due to financial constraints. In order to improve the implementation framework, monitoring of this scheme was introduced.

The Irrigation department of Assam has received assistance from Government of India under AIBP for Implementation of Minor Irrigation Projects. Under Minor Irrigation sector, Irrigation Department received a sanction of 778 numbers of Minor Irrigation schemes since 2001-02 up to 2013-14. Out of these, 555 numbers have been completed up to June 2017 creating additional potential as well as revival of lost potential by improvement of old schemes.

i.2. Non- Lapsable Central Pool of Resources (NLCPR): The broad objective of the NLCPR , created 10% unspent budgetary fund from every Ministry of Government of India except Ocean Development and Atomic Energy, is to ensure speedy development of infrastructure in the North Eastern Region through MoDONER with budgetary support for infrastructure development of North Eastern States.

In the first phase of this program, in General Area, 86 Nos. of ongoing Minor Irrigation Schemes- both surface and ground water were taken up in the year 1999-2000 out of which 82 could be completed.

In the second phase, works of 22 Nos. of on-going Minor Irrigation Schemes were taken up out of which 20 Nos. have been completed.

Since 2007-08, another 7 Nos. of Minor Irrigation schemes are sanctioned out of these 3 Nos. are completed. Since 2000-01, 10 Nos. of ongoing schemes are taken up and completed.

i.3 Command Area Development and Water Management (CADWM): Command Area Development and Water Management (CADWM), a centrally sponsored Programme was launched in the state in 1974-75 with the main objective for bridging the gap between potential created and potential utilized through efficient transportation of irrigation water up to farmer's field through field channels and for equitable distribution of irrigation water with Participatory Irrigation Management through Water Users' Association.

In addition to this, as per a new programme **Incentivization Scheme for Bridging the Irrigation Gap (ISBIG)**, the department has proposed another 15 Nos. of Minor Irrigation Projects and 3 Nos. of Major ongoing Projects under CADWM programme.

i.4 One Time Additional Central Assistance (ACA): One time ACA are the assistance provided by the then Planning Commission for particular States for undertaking important state for specific schemes. This funding is non-recurring.

Bordikorai Irrigation Project under Itakhola Division (Irrigation) in Sonitpur District is the only irrigation project that had received an aim to revive 16994 hectares (NIA) ravaged by devastating flood in July 2004.

i.5 State Action Plan to PMKSY

The State irrigation plan of Assam under PMKSY comprises of District Irrigation Plan of all the twenty seven districts (before bifurcation on 2015) for AIBP and 'Har Ket Ko Pani' component has been approved by State Level Sanctioning Committee (SLSC) in February, 2017.

As per Statistical Handbook of Assam 2021 report, created irrigated area under PMKSY was 17988 hectares during 2020-21.

The gross Irrigated Area of Assam was 113479.63 hectares in 2001-02 which was increased to 291549 hectares in 2020-21. Similarly the Net Irrigate Area was increased from 148477 hectares in 2009-10 to 254453 hectares in 2020-21.

ii. State Funded Projects

Up to the middle of IXth Five Year Plan, almost all the irrigation schemes in the State of Assam under Irrigation Department were implemented by state fund. Later on, seeing the huge capital investment required for implementation of irrigation schemes, many irrigation schemes were taken under different programmes of Government of Assam. Government of Assam launched its own State Plan Fund to implement irrigation schemes in phased manner with programmes:

ii.a Assam Bikash Yojana (ABY): ABY was taken up in 2008-09, 2009-10 and 2010-11. Scheme selected: Medium Irrigation System.

Project: Rupahi Irrigation Project (Medium).

Minor Schemes: Selected 27, completed 20.

ii.b State Plan: Under this programme, 13 schemes were taken up during the period 2010 to 2017. Out of these 6 Nos. were completed.

Gingian Deep Tube Well Irrigation System (DTWIS) with seven points in Gingia Gaon Panchayat of Baghmara Development Block under Behali LAC is a new initiative powered by Solar Energy. Each point would cover 20 hectares each.

ii.c State Specific Scheme: Under this programme, 4 nos. of schemes have been completed during 2014-15.

ii.d CM's Specific Package: Under CM's specific package, work of 2 schemes in Dhemaji District and 2 schemes of Barak Valley have been taken up out of which 2 schemes have already been completed.

ii.e Chief Minister's Samagra Gramin Unnayan Yojana (MSGUY): A 5-year mega-mission called MSGUY was launched in the Financial Year 2016-17, which is scheduled to culminate in the FY 2021-22. Under this scheme on an experimental basis, Electric and Solar hybrid power operated 71 tube well points which were installed in Majuli (20 points), Sonitpur district (20 Points), Kamrup district (20 Points) and Cachar district (11 points). All of them have been successfully installed and 142 hectares of irrigation potential in Net Irrigated Area was created.

ii.f Schedule Caste Sub Plan (SCSP): Under SCSP funding, the department has taken up works of 274 nos. of Minor Scheme during the period of 2005-06 to September 2018. Till May 2019, 234 schemes were completed.

ii.g Tribal Sub Plan (TSP): Under TSP funding, the department has been taken up works of 109 nos. of Minor Irrigation Schemes during the period of 2005-06 to September 2018. Till March 2019, 96 schemes were completed.

ii.h State owned Priority Development Projects (SOPD): Introduced in the financial year 2017-18, it is a state fund for top most economic priority development.

iii. Institution Funded Projects:

iii.a Assam Rural Infrastructure and Agricultural Services Project (ARIASP): Under this programme funded by the World Bank, 222 Minor Irrigation Schemes in General Area were picked up for rehabilitation. Out of these, 192 Nos. were completed.

iii.b National Bank for Agriculture and Rural Development (NABARD) Assistance: NABARD provides funds to various departments under its flagship program, the Rural Infrastructure Development Fund (RIDF), in tranches. The Irrigation Department has received loan assistance from NABARD under RIDF X, XI, XVI, XVIII, XIX, XXIV, XXV, XXVI, and XXVII. From 2004-05 to 2020-21, the Irrigation Department has undertaken 318 Minor Irrigation Schemes, out of which 195 schemes have been completed. This indicates that only 61.3 percent of the minor irrigation schemes have been completed. Additionally, one medium irrigation project has been completed, and the modernization of the Sukla Irrigation Project was undertaken. A list of 20 schemes was submitted to NABARD under RIDF XXVII during 2021-22.

iii.l. North East Council (NEC): NEC was set up as a Regional Advisory Body under the North East Council Act, 1971. Later, it was transformed into a regional planning body by the Amendment Act, 2002. It functions as a planning body for the North East area giving priority to schemes and projects which benefits two or more states.

Under NEC programme, 2 nos. of Minor Irrigation Schemes are completed. Works of another 2 Nos. are in progress.

Growth Trends of Irrigation Facilities in Assam:

Growth Trends of Gross Irrigated Area (GIA), Net Irrigated Area (NIA), Irrigation Potential Created (IPC) and Irrigation Potential Utilisation (IPU) of Major Irrigation System, Irrigation Potential Created (IPC) and Irrigation Potential Utilisation (IPU) of Minor Irrigation System and Season Wise Irrigated area of Assam (From 2007-08 to 2020-21).

Table No. 1.

Growth Trends of GIA, NIA, IPC and IPU of Major Irrigation System, IPC and IPU of Minor Irrigation System and Season wise irrigated area of Assam

Area in Hectares

Year		NIA, Assam	IPC of Major Irrigation System	IPU of Major Irrigation System	IPC of Minor Irrigation system	IPU of Minor Irrigation system	Kharif Season Irrigated Area	Rabi & Pre- Kharif Season Irrigated Area
	GIA, Assam							

1	2	3	4	5	6	7	8	9
2007-08	89269.99	83269.99	222652	36989.7	339257	52280.3	74462.2	14807.8
2008-09	95670.7	95670.6	232077	43973.1	357632	51697.6	75676.7	19994
2009-10	168854	168853.6	239239	80180.5	387470	88673	147769	21084.5
2010-11	130217	130217	243665	50565	403926	79652	108340	21877
2011-12	157685	157685	254343	67675	418955	90010	132678	25007
2012-13	176738	181745	254343	65522	428440	116223	153377	28368
2013-14	377230	188615	262613	64115	440153	124500	159257	29358
2014-15	439156	219578	278783	52295	478927	167283	177876	41702
2015-16	452471	229289	278783	77695	503862	151594	187919	41370
2016-17	452604	227822	279423	80364	524912	147458	172425	55397
2017-18	477942	238971	272518	73108	723513	165863	189744	49227
2018-19	481592	240796	273378	68561	733813	172235	195111	45685
2019-20	595124	258205	285703	78282	738539	219280	254727	42835
2020-21	583108	254455	284921	67005	738913	224544	252383	39168
CAGR	15.53	8.97	1.91%	4.67%	6.17%	11.86%	9.84	7.76

1. Sources: Statistical Handbook of Assam (Various Issues)
2. CAGR estimated by author

Table depicts that there was slight fluctuation in the growth trends of GIA in Assam from 2007-08 to 2010-11 and the growth was in increasing trend during 2011-12 to 2019-20. Thereafter, there was a slight decline in the growth of GIA in 2020-21. There was an annual increase in GIA in Assam by an average of 15.53 per cent. NIA in Assam has shown an increasing trend from 2007-08 to 2009-10 and a slight fall in 2010-11. Thereafter, NIA has been in increasing growth trend from 2011-12 to 2020-21. Overall annual growth rate (CAGR) of NIA in Assam was found to be 8.9 per cent. There was fluctuation in the growth trends of IPC and IPU of Major Irrigation System in Assam. The annual growth rate of IPC in Assam was 1.91 per cent and IPU 4.67 per cent during the study period.

The growth trends of the IPC in Assam's Minor Irrigation sector, indicating a consistent increase throughout the study period. The annual growth rate of IPC in Assam stood at 6.17 percent. While the IPU of Minor Irrigation Systems in Assam displayed a structured trend from 2007-08 to 2015-16. The annual growth rate of Minor Irrigation System utilization in Assam was recorded at 11.86 percent.

The growth trends of the irrigated area in season wise, exhibited a fluctuating nature both in the kharif and rabi seasons throughout the study period. The annual growth rate of the irrigated area during the kharif season was 9.84%, while for the rabi and pre-kharif seasons combined; it was recorded at 7.76% over the same period. Overall, there has been increased in the growth trends of GIA, NIA, IPC and IPU of Major Irrigation System, IPC and IPU of Minor Irrigation System and Season wise irrigated area of Assam during study period due to adoption of various Centrally Funded Projects, State Funded Projects and Institutional Funded Projects in the state.

4. CONCLUSION

As irrigation is an important farm implements to raise the production of kharif season as well as rabi season crops. Because of its important Irrigation Department of Assam has implemented various Central, State and Institutional

sponsor schemes. The result of using Compound Annual Growth Rate shows that there has been rise in the growth trends of GIA, NIA, IPC and IPU of Major and Minor Irrigation system of Assam. Through the utilization of Compound Annual Growth Rate analysis, the results indicate a notable increase in the GIA, NIA, IPC and utilisation of major and minor irrigation system and season wise irrigation facility of Assam. The Government should take initiative to improve and increase the remaining non-irrigated area of 35.1 per cent and of total 41.59 lakh hectares in Assam by implementing policies and schemes which will enhance the agricultural production in the state.

CONFLICT OF INTERESTS

None

ACKNOWLEDGMENTS

None

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