

AN EMPIRICAL ANALYSIS OF LIFT IRRIGATION SCHEMES IN INDIA AND TELANGANA STATE

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Abstract

This study provides an empirical analysis of Lift Irrigation Schemes (LIS) in India and Telangana, examining their growth, distribution, and seasonal utilization. Surface lift irrigation shows modest growth compared to groundwater schemes, with Maharashtra, Odisha, Karnataka, Telangana, and Madhya Pradesh leading in numbers. In Telangana, LIS is highly seasonal, dominated by Kharif and Rabi crops, while perennial irrigation remains minimal. Most schemes are privately owned and operated by small and marginal farmers, with electricity emerging as the primary power source. Findings highlight underutilization of irrigation potential, emphasizing the need for improved infrastructure, resource management, and policy support to enhance sustainability and socio-economic benefits.

Keywords: Lift Irrigation Schemes, Surface Lift Irrigation, Telangana, Seasonal Irrigation, Groundwater Dependence, Agricultural Sustainability.

1. INTRODUCTION

India's agrarian roots go back to its river valley civilizations, where water shaped both farming and livelihoods. Though agriculture's share in GDP has fallen over time, it remains critical to food security, employment, and rural income. Monsoon rains, concentrated in just four months, drain away quickly due to steep terrain and coastal boundaries. Hence, rainwater storage, ice-melt collection, and irrigation systems are vital, especially in the dry winter season. Traditionally, irrigation relied on canals, wells, and tanks that stored rainwater through embankments. These localized systems supported farmers during seasonal scarcity. The first Minor Irrigation Census (MIC-I, 1986-87) recorded 12.35 million schemes, dominated by groundwater sources, while surface lift irrigation (SLS) accounted for only 0.49 million schemes, mainly in Peninsular India. By MIC-II (1993-94), the growth was modest at 1.76 percent, showing slow expansion.

The third census (2004-05) marked rapid expansion, with 19.75 million schemes, including 0.64 million SLS. MIC-IV (2014 November) reported 21 million schemes and 6.47 lakh SLS irrigating 2.54 million hectares. MIC-V (2017 November) showed marginal growth (3.37%) but confirmed groundwater dominance at 94.5 percent. By MIC-VI (2023 August), schemes reached 23.1 million, though dug wells, shallow tube wells, and SLS declined, while tube wells and surface flow gained ground.

Across all censuses, SLS showed common traits 83.9% private ownership, largely among small and marginal farmers (70.6%). OBCs, STs, SCs, and other groups all participated, with funding mainly self-financed (70%), supplemented by loans (14%) and subsidies (11%). Technology shifted toward centrifugal and submersible pumps, with electricity (76%) emerging as the main

power source, replacing diesel. This reflected both modernization and dependence on farm-level resources.

Telangana mirrors national trends, with 85 percent of SLS privately owned and 91 percent managed by individual farmers. Caste composition resembles India's mix, with OBCs (30-32%), STs (18-20%), SCs (10-12%), and others (35-38%). About 71-75 percent of schemes are self-funded, while institutional aid remains limited. Electricity powers around 70 percent of pumps, with diesel at one-fourth. Water distribution has modernized to underground and surface pipes, though open channels persist. Overall, SLS peaked around MIC-IV but has since declined slightly, with Telangana showing marginally higher private ownership and electricity reliance than the national average.

2. REVIEW OF LITERATURE

Singh, H. P., et al. (2013)¹. Evaluation of the Sirsa Manjholi Lift Irrigation Scheme in Solan, Shivalik Himalayas. The study found poor physical performance and no change in cropping pattern due to lack of permanent diversion headworks. Declining river levels and minimal farmer participation led to limited irrigation potential and unsatisfactory outcomes. Nikam, S. A., et al. (2015)². Environmental effects of the Saswad-Purandar Lift Irrigation Scheme: A case study. Soil and groundwater pollution exceeded permissible limits in the Mula-Mutha River basin. The study recommended low-cost aerated lagoons for effective and economical water quality improvement. Purandare, V., & Bajaj, V. H. (2016)³. Analysis of rainfall and inflow values: Case study of Mhaisal Lift Irrigation Project, Maharashtra. Rainfall and inflow data from the Krishna and Koyna catchments were statistically analyzed to assess water availability. Results supported optimized seasonal water allocation for sustained LIS operations. Kasi, E. (2016)⁴. Lift Irrigation Schemes in Andhra Pradesh: Technology as a boon or bane? The research linked sustainable LIS performance to technology adoption and management practices. It emphasized solar energy as an eco-friendly option and discussed political constraints affecting marginal farmers. Sreeja, K., et al. (2017)⁵. Design of an offtake structure for a Lift Irrigation System. The design was based on specified discharge and site conditions following IS code standards. Multiple checks ensured structural reliability, and final drawings validated technical soundness. Karimov, A. Kh., et al. (2018)⁶. Reducing the energy intensity of lift irrigation schemes in northern Tajikistan: Potential options. The study explored energy-efficient alternatives for lift irrigation to improve crop productivity. Implementing such measures enhanced farmer income and reduced operational costs. Rao, A., & Babu, M. R. (2018)⁷. Socio-economic aspects of farmers under Lift Irrigation Schemes on Nallamada Drain in Krishna Western Delta. Assured irrigation improved crop yields, income, and living standards among farmers. Women benefitted from better healthcare, education access, and enhanced livelihood quality. Jain, V., et al. (2019)⁸. Impact of Lift-cum-Micro Irrigation Model for developing livelihood opportunities in Chhattisgarh Plains. The model improved food production, rural income, and employment opportunities. Drip irrigation helped reduce crop water stress under scarcity conditions. Jadhav, A. S., & Patil, Y. M. (2020)⁹. Evaluation of Lift Irrigation Scheme through conveyance efficiency and cropping pattern. The study found significant deviation between designed and actual cropping patterns, affecting

efficiency. Despite this, 84% conveyance efficiency indicated effective water delivery. Ghatage, T. G. (2020)¹⁰. Growth and development of Co-operative Lift Irrigation Schemes and their impact in Shirol Tehsil, Kolhapur District. The study reported increased irrigation intensity, productivity, and improved land use. However, issues like soil salinity, degradation, and waterlogging were noted as adverse impacts. Karimov, A. Kh., et al. (2021)¹¹. Water–energy nexus in Central Asia’s lift irrigation schemes: multi-level linkages. Integrating aquifer storage and drip irrigation saved 24% water and 19% energy. The system reduced salinity and greenhouse gas emissions, enhancing sustainability. Pradhan, A., et al. (2021)¹². Lift irrigation from dry river bed through shallow tube well in Odisha. Feasibility and techno-economic analyses confirmed the viability of a shallow tube well in the Mahanadi dry bed. Crop water needs were assessed using CROPWAT and hydraulic recovery tests. Chavhan, G., & Kallolikar, S. K. (2022)¹³. Lift Irrigation Schemes in Bagalkot District under the Upper Krishna Project: A review. The study assessed irrigation potential using Almatti and Narayanapur backwaters, serving 97,000 hectares. It highlighted successful project development under the Krishna basin program. Mounica, G. C., et al. (2022)¹⁴. Impact of Alimineti Madhava Reddy Lift Irrigation Scheme on gender in Nalgonda District, Telangana. Women in beneficiary households showed greater involvement in production and economic decisions. Their empowerment was linked to higher literacy and income growth. Karimov, A. Kh., et al. (2023)¹⁵. Community-Led Lift Irrigation Systems (JCLIS) in Jharkhand: An assessment of sustainability. The study found JCLIS sustainable but capital-intensive, with inequitable private ownership of pumps. Public cost-sharing ensured better equity and water use efficiency. Jadhav, K. M., & Chavan, S. P. (2023)¹⁶. Design criteria of Lift Irrigation Schemes. This paper outlined essential design parameters and emphasized compliance with IS codes. It provided clear guidance for designing technically sound and efficient LIS systems. Gopi, H. A., & Rangappa, K. B. (2023)¹⁷. Lift Irrigation Scheme of Karnataka State: A critical review. Using analytical methods, the study noted positive outcomes among small farmers but limited SC/ST awareness. Recommendations were provided to enhance scheme implementation. Chetri, G., & Kalita, M. (2024)¹⁸. Low-cost mobile solar-operated Lift Irrigation System: A case study from Assam. The study promoted solar-powered mobile systems for multi-crop irrigation. It demonstrated cost-effectiveness, mobility, and adaptability in disaster-prone agricultural zones. Lamichhane, S., et al. (2024)¹⁹. Assessing and enhancing the sustainability of Lift Irrigation Systems in Nepal. Using a sustainability index, only 6.7% of schemes were fully sustainable. Structural deficiencies and poor maintenance emerged as primary limitations to performance. Koli, P. S., & Chavan, S. S. (2024)²⁰. Critical analysis of Lift Irrigation Scheme: A case study on Wakurde LIS. Economic feasibility analysis using Benefit–Cost Ratio and IRR revealed cost-time overruns. The study proposed management reforms to enhance project efficiency. Gumma, M. K., et al. (2024)²¹. Geospatial assessment of cropping pattern shifts and water demand in Kaleshwaram LIS, Telangana. Satellite data showed an 80% rise in rice cultivation, escalating water demand. The study emphasized sustainable practices for long-term agricultural resilience.

3. RESEARCH GAP

Despite numerous studies on lift irrigation schemes, limited research integrates water, energy, and socio-economic dimensions for long-term sustainability. Most studies focus on technical or financial aspects, neglecting environmental impacts, governance, and gender considerations. Comprehensive evaluation of technical, environmental, and socio-economic factors is needed to ensure sustainable lift irrigation management.

4. OBJECTIVES

1. To analyze the growth, distribution, and seasonal utilization of Lift Irrigation Schemes (LIS) in India and Telangana.
2. To examine ownership, management, technology patterns, and socio-economic impacts of LIS on farmers.
3. To evaluate the efficiency, constraints, and sustainability of surface lift irrigation schemes in Telangana.

5. METHODOLOGY

The study uses secondary data from Minor Irrigation Census (MIC-I to MIC-VI), Ministry of Jal Shakti, and Telangana irrigation records. Data analysis includes trend assessment, growth rates, descriptive statistics, and comparative evaluation across states and seasons. A descriptive-analytical approach links LIS performance with socio-economic and environmental factors to assess sustainability and efficiency.

6. SCOPE OF THE STUDY

The study covers Minor Irrigation schemes in India, with a focus on surface lift irrigation schemes in Telangana. It analyzes growth trends, types, seasonal potential, utilization, ownership, management, and technology adoption. Insights are provided for sustainable water resource planning, policy interventions, and improving irrigation practices in water-stressed regions.

7. LIMITATIONS OF THE STUDY

The study relies primarily on secondary data, which may have reporting gaps or inaccuracies. Seasonal and field-level variations in water availability, cropping patterns, and farmer practices are not fully captured. Socio-economic impacts are generalized, with limited insight into individual household-level differences.

8. HISTORY OF MINOR IRRIGATION SCHEMES IN INDIA -TELANGANA

The history of minor irrigation in India dates back to ancient times when tanks, wells, and canals built by local rulers supported agrarian societies. During the colonial era, focus shifted to large canal projects, leading to neglect of traditional minor systems. Post-independence, priority was given to major multipurpose projects, though later decades saw rapid expansion of groundwater irrigation through wells and tube wells. Since 1986, the Government of India has conducted Minor Irrigation Censuses to assess development and promote sustainable management. In Telangana, the Kakatiya-era tank system was revived after 2014 through *Mission Kakatiya*, restoring thousands of tanks to enhance local irrigation and livelihoods.

Table 1. Minor Irrigation schemes in India

| Sl No | Name of the census | Number of MIS | Deviation | % |
|-------|--------------------|---------------|-----------|---|
|-------|--------------------|---------------|-----------|---|

| | | | | |
|---|-------------------|----------|----------|--------|
| 1 | MIC -I (1986-87) | 12348578 | 00 | 0.00 |
| 2 | MIC -II (1939-94) | 12566233 | 2,17655 | 1.76 |
| 3 | MIC -III (2005) | 19752199 | 7185966 | 57.18 |
| 4 | MIC -IV (2014) | 21000000 | -1247801 | 6.32 |
| 5 | MIC -V (2017) | 21714133 | 714133 | 3.40 |
| 6 | MIC -VI (2023) | 23138964 | 1424831 | 6.58 |
| | | CAGR | | - 6.74 |

Source: 6 Minor Irrigation Census

Table 1 shows that Minor Irrigation schemes in India have expanded steadily though unevenly over the past 36 years. Starting with 1.23 crore schemes in MIC-I (1986–87), growth was modest in MIC-II (1993–94) with only a 1.76 percent rise. A major expansion occurred in MIC-III (2005), when the number surged to 1.98 crore, marking a 57.18 percent increase driven by strong policies and investments. Growth then slowed in MIC-IV (2014) with only 6.32 percent addition, indicating stabilization, and remained moderate in MIC-V (2017) at 3.40 percent. The latest round, MIC-VI (2023), recorded 2.31 crore schemes, a 6.58 percent rise, signaling revival backed by renewed policy support. The overall CAGR for 1986-87 to 2023 stands at 6.74 percent, reflecting long-term consistent growth with distinct phases of rapid expansion, slowdown, and recovery.

Table 2. Top Ten Minor Irrigation States in India

| Sl No | Name of the State | 5 MIC | 6 MIC | Difference |
|-------|-------------------|---------|---------|------------|
| 1 | Uttar Pradesh | 3801286 | 3976317 | 1,75,031 |
| 2 | Maharashtra | 2920874 | 3572864 | 6,51,990 |
| 3 | Madhya Pradesh | 2082229 | 2285293 | 2,03,064 |
| 4 | Tamil Nadu | 2072517 | 2114909 | 42,392 |
| 5 | Telangana | 1522292 | 1679868 | 1,57,576 |
| 6 | Rajasthan | 1471068 | 1491073 | 20,005 |
| 7 | Karnataka | 1353889 | 1405215 | 51,326 |
| 8 | Gujarat | 1330226 | 1396085 | 65,859 |
| 9 | Andhra Pradesh | 1054356 | 1190964 | 1,36,608 |
| 10 | Punjab | 1120963 | 1175489 | 54,526 |

Source: Government of India ministry of jal shakti Department of water resources, river Development and Ganga Rejuvenation Minor Irrigation

Table 2 shows the top ten Minor Irrigation (MI) states in India, all of which recorded growth in schemes between the 5th and 6th MI Census. Southern states Tamil Nadu, Telangana, Karnataka, and Andhra Pradesh together contributed significantly, reflecting irrigation's role in drought management. Maharashtra, Telangana, and Andhra Pradesh showed the strongest expansion due to proactive policies, while Rajasthan and Tamil Nadu registered only marginal gains, likely from geographical or saturation limits. Uttar Pradesh remained dominant with its vast irrigated area. Overall, Maharashtra led in absolute growth, Uttar Pradesh in total share, but regional disparities persist, with water-stressed states expanding faster than constrained ones.

Table 3. Minor Irrigation Schemes in Telangana

| Sl. No | Types Minor Irrigation Schemes | In Numbers | Percent % |
|--------|--------------------------------|------------|-----------|
| 1 | Dug Wells | 457784 | 27.25 |
| 2 | Shallow Tube well | 76790 | 4.57 |
| 3 | Medium Tube well | 677156 | 40.31 |
| 4 | Deep Tube well | 367519 | 21.88 |
| 5 | Surface flow | 62753 | 3.74 |
| 6 | Surface lift | 37866 | 2.25 |
| | Total | 16,79,868 | 100.00 |

Source: Minor Irrigation Census

Table 3 presents Minor Irrigation Schemes in Telangana, Telangana has a total of 16,79,868 minor irrigation schemes, with 94 percent dependent on groundwater sources. Medium tube wells (40.31%) dominate, followed by dug wells (27.25%) and deep tube wells (21.88%), showing rising pressure on deeper aquifers. Surface flow (3.74%) and surface lift (2.25%) schemes remain limited, indicating poor utilization of rivers and tanks. Excessive groundwater use raises depletion risks, stressing the need for aquifer recharge, tank rejuvenation, and sustainable water management.

History of Lift Irrigation Schemes in India – Telangana

Lift irrigation in India began in the early post-independence period to utilize river and reservoir water for upland areas where canal irrigation was not feasible. During the 1970s–1990s, technological advances and rural electrification encouraged large-scale adoption of electric and diesel pump-based lift schemes. Several state and central government programs promoted community and cooperative lift irrigation projects to improve agricultural productivity. In Telangana, lift irrigation gained prominence with major projects like the Sriram Sagar, Nizamsagar, and especially the Kaleshwaram Lift Irrigation Project, one of the world’s largest multi-stage lift systems. Today, Telangana continues expanding modern lift schemes to ensure water availability for drought-prone regions and enhance sustainable agriculture.

Table 4. Surface Lift Irrigation schemes from 1986-87 to 2023in India

| Sl No | Name of the census | Number of LSI | Deviation | % |
|-------|--------------------|---------------|-----------|--------|
| 1 | MIC -I (1986-87) | 449235 | 00.00 | 00 |
| 2 | MIC -II (1939-94) | 396841 | 52394 | -11.66 |
| 3 | MIC -III (2005) | 606918 | 210077 | 52.95 |
| 4 | MIC -IV (2014) | 647738 | 40820 | 6.73 |
| 5 | MIC -V (2017) | 600093 | 47645 | -7.35 |
| 6 | MIC -VI (2023) | 595981 | 4112 | -0.69 |
| | | CAGR | | 0.77 |

Source: Minor Irrigation Census, Note: MIC: Minor Irrigation Census

Table 4 shows that surface Lift Irrigation schemes from 1986-87 to 2023, surface lift irrigation schemes in India showed fluctuating growth, rising from 4.49 lakh to about 5.96 lakh. After an initial decline in 1993-94, the sector expanded rapidly till 2014, peaking at 6.47 lakh schemes

before stabilizing. Overall, the increase of 1.47 lakh schemes over 36 years reflects moderate growth and stagnation compared to groundwater-based irrigation.

Table 5. Top Ten surface Lift Irrigation schemes States in India

| Sl No | Name of the State | 6 MIC |
|-------|-------------------|--------|
| 1 | Maharashtra | 239278 |
| 2 | Odisha | 63899 |
| 3 | Karnataka | 52890 |
| 4 | Telangana | 37866 |
| 5 | Madhya Pradesh | 33093 |
| 6 | Uttar Pradesh | 27790 |
| 7 | West Bengal | 21937 |
| 8 | Kerala | 21852 |
| 9 | Jharkhand | 17285 |
| 10 | Gujarat | 17141 |

Source: Government of India ministry of jal shakti Department of water resources, river Development and Ganga Rejuvenation Minor Irrigation

Table 5 shows that Maharashtra leads India in surface lift irrigation schemes with 2.39 lakh, followed by Odisha, Karnataka, Telangana, and Madhya Pradesh, together forming the major share. These semi-arid and drought-prone states depend on lift irrigation to manage rainfall variability and limited canal networks. Overall, surface lift irrigation is vital for bridging water gaps, supporting smallholders, and sustaining agriculture in water-scarce regions.

Table 6. Types of Surface Lift Irrigation in India

| Sl. No | Types of Surface Lift Irrigation | In Numbers | % |
|--------|--------------------------------------|------------|--------|
| 1 | On River | 205010 | 34.4 |
| 2 | On Stream | 62854 | 10.51 |
| 3 | On drain / Canal | 82388 | 13.8 |
| 4 | On Tanks/ponds/Reservoirs/check-dams | 130837 | 22.0 |
| 5 | Others | 114892 | 19.3 |
| | Total | 5,95,981 | 100.00 |

Source: Minor Irrigation Census

Table 6 shows that India has a total of 5.96 lakh surface lift irrigation schemes, with rivers (34.4%) and tanks or reservoirs (22%) forming the core sources. Drain/canal (13.8%) and stream-based (10.5%) schemes add to regional diversity, while the “others” category (19.3%) shows flexible local adaptations. Overall, river and tank systems together supply over half of India’s lift irrigation, ensuring water access in both riverine and drought-prone regions.

Table 7. Types of Surface Lift Irrigation in Telangana

| Sl. No | Types of Surface Lift Irrigation | In Numbers | % |
|--------|----------------------------------|------------|------|
| 1 | On River | 7561 | 20.0 |
| 2 | On Stream | 13536 | 35.7 |

| | | | |
|---|--------------------------------------|-------|--------|
| 3 | On drain / Canal | 13961 | 36.86 |
| 4 | On Tanks/ponds/Reservoirs/check-dams | 2273 | 6.0 |
| 5 | Others | 535 | 1.4 |
| | Total | 37866 | 100.00 |

Source: Minor Irrigation Census

Table 7 presents the types of surface lift irrigation in Telangana has 37,866 surface lift irrigation schemes, mainly dependent on drains/canals (36.9%) and streams (35.7%), which together form over 70% of the total. River-based schemes (20%) also contribute notably, while tanks and ponds (6%) remain underused despite local potential. Overall, Telangana's irrigation is dominated by canal and stream systems, with 94.01 percent groundwater and only 5.99 percent surface water schemes.

Table 8. Season wise Potential created Through in use Surface Lift Irrigation Schemes (Minor Projects) in Telangana

| Sl. No | Irrigation Potential created | In Hectares | Acres |
|--------|------------------------------|-------------|------------|
| 1 | Kharif | 46753.83 | 115,481.96 |
| 2 | Rabi | 36129.35 | 89,239.49 |
| 3 | Perennial | 282.31 | 697.30 |
| 4 | Others | 1074 | 2,652.78 |
| | Total | 84239.49 | 2,08071.54 |

Source: Minor Irrigation Census

Table 8 presents the season-wise irrigation potential created through in-use Surface lift irrigation schemes in Telangana create a total potential of 84,239.49 hectares, contributing significantly to agricultural land use. Kharif accounts for the largest share (55.5%), followed by Rabi (42.9%), while perennial irrigation remains minimal at only 0.33%. Overall, irrigation is highly seasonal, emphasizing the need to expand year-round water availability and strengthen off-season infrastructure.

Table 9. Season wise Potential Utilized Through in use Surface Lift Irrigation Schemes Insider & Out sider Command area of Major/ Medium Projects in Telangana

| 1 | Irrigation Potential Utilized Insider Command Area | In Hectares | Area in Acres |
|---|--|-------------|---------------|
| | Kharif | 11933.97 | 29476.90 |
| | Rabi | 9361.52 | 23,122.95 |
| | Perennial | 155.27 | 383.51 |
| | Others | 0.81 | 2.00 |
| | Total | 21451.57 | 52,985.37 |
| 2 | Irrigation Potential Utilized Out sider Command Area | In Hectares | Area in Acres |
| | Kharif | 30518.04 | 75,379.55 |
| | Rabi | 23044.51 | 56,919 |
| | Perennial | 129.80 | 320.60 |

| | | |
|-----------|-----------|------------|
| Others | 12.17 | 30.05 |
| Total | 53704.52 | 1,32650.16 |
| Total 1+2 | 75,156.09 | 1,85635.54 |

Source: Minor Irrigation Census

Table 9 shows the season-wise potential utilized through surface lift irrigation schemes in Telangana's insider and outsider command areas of Major and Medium Projects. The insider command area (ICA) utilizes 21,451.57 hectares (52,985.37 acres), with Kharif crops dominating at 11,933.97 hectares and Rabi at 9,361.52 hectares, while perennial and other uses are minimal. The outsider command area (OCA) has a higher utilization of 53,704.52 hectares (1,32,650.16 acres), led by Kharif (30,518.04 hectares) and Rabi (23,044.51 hectares), with perennial and other crops remaining negligible. Overall, total utilization across both areas is 75,156.09 hectares (1,85,635.54 acres), with Kharif season accounting for more than half. This indicates that surface lift irrigation in Telangana is largely seasonal, primarily supporting Kharif and Rabi crops, with outsider areas benefiting more due to limited canal supply, and minimal scope currently for year-round irrigation.

Table 10. Surface Lift Irrigation schemes from 1986-87 to 2023-24 in Telangana state

| SI No | Name of the census | Number of LSI | Deviation | Grow rate |
|-------|--------------------|---------------|-----------|-----------|
| 1 | MIC -I (1986-87) | 8905 | 00 | 00.00 |
| 2 | MIC -II (1939-94) | 9311 | 406 | 4.56 |
| 3 | MIC -III (2005) | 12096 | 2785 | 29.90 |
| 4 | MIC -IV (2014) | 12273 | 177 | 1.46 |
| 5 | MIC -V (2017) | 30059 | 17786 | 144.95 |
| 6 | MIC -VI (2023) | 37866 | 7,807 | 25.96 |
| | | CAGR | | 4.10 |

Source: Minor Irrigation Census

Table 10 highlights the growth of Surface Lift Irrigation (SLI) schemes in Telangana from 1986-87 to 2023. The number of schemes increased from 8,905 to 37,866, marking 4.2 times rise over 36 years. The overall CAGR of 4.10 percent indicates steady yet uneven progress. Growth was modest between 1986-2005 and nearly stagnant during 2005-2013. A historic surge of 145 percent occurred in 2013–2017, driven by statehood and new irrigation initiatives. Post-2014, Telangana state government-led policies ensured expansion, with moderate growth continuing till 2023.

9. FINDINGS

- Minor Irrigation schemes in India have expanded steadily over the past 36 years, with surface lift irrigation schemes showing fluctuating growth and modest overall contribution compared to groundwater schemes.
- Maharashtra, Odisha, Karnataka, Telangana, and Madhya Pradesh account for the majority of surface lift irrigation schemes, highlighting regional disparities and the importance of semi-arid, drought-prone regions.

- In Telangana, surface lift irrigation is highly seasonal, with Kharif and Rabi crops dominating, while perennial irrigation remains minimal. Drain/canal and stream-based schemes form over 70 percent of LIS, reflecting dependence on natural and constructed water channels.
- Ownership is predominantly private, with small and marginal farmers managing most schemes, and electricity has become the dominant power source for pumping, replacing diesel.
- Despite expansion, utilization of irrigation potential is limited, especially for perennial crops, indicating underdeveloped infrastructure and the need for better resource management.

10. CONCLUSION

Lift Irrigation Schemes play a critical role in supplementing water for agriculture, particularly in water-stressed and semi-arid regions. While India and Telangana have witnessed significant growth in LIS, their seasonal nature, private ownership, and limited perennial irrigation constrain optimal utilization. Policy interventions, infrastructure improvements, and integrated management of surface and groundwater resources are essential to enhance efficiency, sustainability, and socio-economic benefits. Strengthening perennial irrigation and modernizing distribution systems can support year-round cultivation and improve rural livelihoods.

Conflict of Interest:

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