

PRIME MINISTER AGRICULTURE IRRIGATION SCHEME WITH REFERENCE TO BIHAR STATE: AN OVERVIEW

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ABSTRACT

Since Independence, the govt. of India has made huge investments in development of water resources. The performance of public funded irrigation projects has been continually declining over the years because of system maintenance issues, inefficient delivery systems, moreover as inefficient management at field level. Further, the expansion of irrigated area doesn't commensurate with the number of capital invested. Despite huge investments, the world under irrigation has not increased and at the identical time, yields are stagnating. The storage capacity of most of the massive and medium capacity reservoirs has declined (both live and dead storage capacity) by 20-30 over the years, due to excessive siltation resulting in less water storage and availability. Although large-scale surface irrigation projects have harvested substantial amount of water (300 billion kiloliter per year), which is sort of capable the groundwater withdrawal, the cultivated acreage using surface water sources is sort of half, in comparison to it using groundwater sources. This means indiscriminate use of water and low tide use efficiency. Further, increased cost of cultivation and soil salinity ends up in unsustainable agriculture in such irrigated areas. The revolution during the 1970s together with advanced technology of water pumping made a big impact on groundwater use. Individual farmers made huge private investments for developing and using groundwater resources, significantly enhancing the irrigated areas. Innovations in pumping technology together with free or subsidized power supply has accelerated groundwater extraction, leading to overexploitation and declining groundwater resources to unsustainable levels in many parts of the country. Even in irrigated areas, there's huge disparity in water access and utilization among end users, which has resulted in groundwater overexploitation, thus lowering the groundwater table in canal irrigated areas likewise. In irrigated areas, farmers have changed to economically remunerative crops that need intensive cultivation and more water.

Keywords: Agriculture, Efficiency, Innovations, Discrimination, Political, Cultivated, Harvesting.

Introduction

In the past, communities developed and managed water harvesting structures like tanks in southern India, havelis in Bundelkhand, khadins in Rajasthan, jalmandhir in Gujarat, and in other states too. These water harvesting structures contributed in terms of water for domestic and agricultural usage. However, because of breakdown of institutional mechanisms, poor maintenance, siltation, change in land-use practices and reduced inflows, these structures became non-operational over the years. Only some states like province, Maharashtra and Tamil Nadu have adopted significant areas under micro-irrigation. The poor adoption is attributed to variety of things, such as, high cost, complexity of the technology and other socio-economic issues, such as, lack of access to credit facilities, fragmented landholdings, localized crop pattern, etc. Further, faulty design of irrigation system is another important factor forcing poor adoption of micro-irrigation, especially among the little and marginal farmers. In some parts of province, farmers were ignorant about the upkeep package to be adopted for drip systems, which acted as a constraint for its adoption. High costs of soluble fertilizers also restricted the utilization of efficient fertigation practices. With increasing water scarcity, farmers in rural and peri-urban areas are using untreated domestic wastewater for agriculture, thus increasing the chance of nitrate pollution in addition as health hazards for agricultural workers and consumers. To handle the difficulty of

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sustainability of food production, in an environment friendly way, important matters in irrigated agriculture need urgent attention. This can be possible only by enhancing the efficiency of irrigation schemes, minimizing transmission losses, minimizing land degradation (salinization, water logging and pollution of groundwater and environment), controlling overexploitation of groundwater and increasing agricultural productivity yet as profitability.

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

In a bid to reinforce agricultural productivity by covering more area under irrigation and strengthening distribution networks in an integrated manner followed by its effective monitoring, Ministry of Water Resources, River Development and Ganga Rejuvenation has taken multi-pronged measures to satisfy the challenges in respect of development and management of water resources. This includes agency completion of an outsized number of major and medium irrigation projects, surface minor irrigation (MI) schemes and repair, renovation & restoration (RRR) of water bodies within the country through this plan. Launched in 2015, this program is an amalgamation of existing components with an “output-driven” approach as an umbrella programme with four components envisioning increased irrigation potential through Accelerated Irrigation Benefit Programme (AIBP), create, strengthen and restore water sources and its distribution networks to maximise the use of created irrigation potential through “Har Khet Ko Pani” or Command Area Development and Water Management (CAD&WM), Repair, Renovation and Restoration (RRR) of Water Bodies, Surface Minor Irrigation (SMI) Scheme and H2O component to enhance water use efficiency by promoting micro-irrigation (Per Drop More Crop) and effectively manage run-offs and soil and moisture conservation, ridge and catchment area treatment (Watershed Development). For area but that "Har Khet Ko Pani" component comes into play which has Surface Minor Irrigation (SMI), Repair, Renovation and Restoration (RRR) of Water Bodies and well water Development. In other words, dams, canals, distribution networks up to outlet levels are taken care of by AIBP while works beyond outlets are covered under "Har Khet Ko Pani" to make sure every farm gets adequate water. Flowing from the supervision of inter-ministerial National commission (NSC) chaired by the Prime Minister, PMKSY follows a “decentralized” three-tiered institutional structure with High Level Empowered Committee (HLEC) at the Central level, State Level Sanctioning Committee (SLSC) at the State level and District Level Implementation Committee (DLIC) at the district level besides dynamic involvement of stakeholders. There’s also a provision of getting two progressive farmers and one NGO as members of DLIC, a step that engenders public participation. One among the key reasons for the projects to stay incomplete was inadequate provision of central and State share funds. As a result, great deal of funds spent on these projects were locked up and also the benefits envisaged at the time of formulation of the projects couldn’t be achieved. This was a cause for concern and initiative was required at the national level to remedy things.

The Position of Bihar

The analysis points to a change within the understanding of the role of the government within the development of the agricultural sector in Bihar. One common noticeable feature of the “success” stories considered during this report is that the low level of state involvement in them. When communities are empowered and involved within the day-to-day management of the resources, and in planning and formulating schemes in step with their own needs, positive results are sure to emerge. Accountability starts at the grassroots level and moves upwards, thus improving overall service delivery and benefiting all stakeholders, including the government. Similarly, when given the chance under a supportive policy environment, entrepreneurial activity picks up and also the private sector gets involved in supply chain development. The government plays a key role in setting the general strategy to develop the agricultural sector and facilitate its implementation within an enabling regulatory environment. As this analysis has shown, the government’s role in coordinating capacity-building activities and funding the stakeholder-based group initiatives has been and remains crucial for his or her success and sustainability. Similarly, for commodity supply chains to develop, the government retains a crucial role in rehabilitating infrastructure, fostering public-private partnerships, encouraging investment, and amending key market legislation like the APMC act. Even as important, the government also must provide a stable and supportive policy environment, strengthen land institutions, legalize tenancy, and computerize land records. Although Bihar has, in many ways, skipped over on the advantages of the rice/wheat revolution, the question remains whether it can benefit of its latent agro-enterprise potential. Active competition is probably going to be found at the enterprise level, which responds to consumer requirements to develop low-cost systems and/or to differentiate products. Nonetheless, states’ comparative advantage/disadvantage across a variety of parameters (for example, factor endowment, infrastructure, regulatory environment) is probably going to be significant in attracting private investment.

Enhancing Efficiency and Success of the PMKSY

The success of PMKSY will rely upon participatory planning, implementation and monitoring by adopting a result-based framework together with enabling integration and convergence to market full-fledged implementation and monitoring. The subsequent crosscutting strategies are essential for PMKSY's success.

- **Micro-Watershed as Implementation Unit:** The implementation unit should be a micro watershed (5,000 to 10,000 ha), which may be further integrated for planning purposes into meso- and macro-watersheds and subsequently to sub-basin and basin levels. Managing water efficiently under different agro eco systems could be a challenging task. As discussed earlier, managing green and blue water resources in an integrated manner is that the need of the hour and it may be worn out the simplest possible way in a micro catchment i.e., watershed scale. These watersheds may be integrated into meso- and macro-watersheds and further into sub-basins and basins for effective planning, management, monitoring and achieving impacts. For efficient allocation of accessible water and its proper use, auditing and budgeting must be undertaken at different watershed and basin scale.
- **Convergence with MGNREGA and National Rural Livelihood Mission:** The spiritual leader National Rural Employment Guarantee Act (MGNREGA) can benefit soil and conservation efforts, as demonstrated in province, Madhya Pradesh and Telangana. Activities within the PMKSY need huge labor for undertaking soil and conservation measures, also as for enhancing the efficiency of water use and accelerating the advantages of irrigation and MGNREGA are often tapped for this. Detailed guidelines must be developed, supported the experiences which may be of further help.
- **Better Water Management:** Building awareness among farmers for efficient use of water is required as they need the perception that excessive irrigation ends up in higher crop yields. However results show the alternative, causing land degradation, due to salinization and water logging. However, the water allocation should be equitable, realistic and must be worn out a transparent manner. Integrated Water Resource Management (IWRM) framework must be developed and adopted urgently additionally to developing technologies to boost green water use efficiency, conjunctive use of groundwater and surface water and proper drainage. This may help increase WUE, agricultural productivity, moreover as family incomes and sustainable growth in command areas.
- **Integration of Solar Power into the PMKSY:** Use of renewable energy like solar energy has to be integrated to reinforce the impact of PMKSY and achieving sustainable development of agriculture. Alternative energy may be effectively used for pumping water from water harvesting structures (farm ponds) and to facilitate efficient irrigation systems like drip and sprinklers within the fields. The incentives provided for the employment of alternative energy have to be integrated by adopting one window approach, wherein, the department implementing PMKSY is provided financial resources from other departments accountable for incentivizing solar projects. One such example is that the department of non-renewable energy. Such an approach wouldn't only simplify the method of using alternative energy, but also end in larger impacts because of convergence and integration with efficient use of water within the agricultural fields. Good samples of alternative energy use are often seen in Gujarat and Rajasthan, and there's an urgent must scale-up this initiative for achieving the goal of PMKSY.
- **Use of High-Science Tools for Planning, Implementation and Monitoring:** The success of a scheme like PMKSY cannot be achieved in an exceedingly 'business as usual' style. Innovations in strategy, institutional mechanisms and policies are essential ingredients for its success. This could only be achieved by ensuring convergence of the present actors while handling these components. Science tools like remote sensing images and data, water budgeting modeling tools, scenario development simulations together with GIS and soft skill planning participatory tools have to be used. Crop simulation models together with assessing market intelligence and effective capacity development are essential. Systems modeling are another emerging technique which guides users on resource availability (groundwater, surface water, and soil moisture), its management and various alternatives, to attain yield potential. Various studies demonstrated the employment of hydrological tools to investigate upstream and downstream availability of water with the support of primary and secondary data. Others like ICT digital tools should even be integrated to attain success.

- **Use of ICT in Decision Making, Monitoring, Impact analysis, Knowledge Dissemination:** Lack of data and data about input availability, improved technologies and welfare schemes, is one in all the hindrances for poor technology adoption. With increasing connectivity through the Digital India initiative of the GoI, there's wide scope for decision-making, monitoring, impact analysis and knowledge dissemination for resource optimization in agriculture and allied sectors using ICT. As trained human resource may be a major constraint within the agriculture extension system, various ICTs are available which might bridge the gap between farmer and knowledge generator. For e.g., an obsessive web portal for farmers has been developed that caters to numerous services associated with agriculture, including agro advisory, weather and market information.

Conclusion

The foregoing initiatives shall help in meeting challenges in supply further as demand side management. Implementation of 99 projects shall help in increasing potential creation and complete utilization of their ultimate potential of 76 Lakh hectares. Further, PMKSY addresses the concerns of growing water scarcity within the country by promoting conservation through Per Drop More Crop and Watershed Management. This scheme will improve on-farm water use efficiency to cut back wastage and increase availability both in duration and extent, adoption of precision-irrigation and other water saving technologies, enhance recharge of aquifers and introduce sustainable conservation practices, make sure the integrated development of rain fed areas using the watershed approach towards soil and conservation, regeneration of water, arresting runoff, and crop alignment. Other short term measures like scheme for bridging gap between IPC and IPU, development of spring water resources in Eastern and North Eastern region of the country, ILR projects etc. are planned in such the way that they're going to make sure of both the provision side also as demand side management within the short term. Further, the design is fully created but also utilised during a sustainable way with the assistance of participatory irrigation management through Water User Associations and beneficiaries. This shall help in big way for meeting the food demand of the country which is predicted to rise to about 405 MT in 2050. In an exceedingly nutshell, impediments are being controlled, accountabilities are being fixed, transparency is being ensured and awareness is being created to fulfill time-bound targets. The goal has been set and every one efforts to succeed in the destination are fully swing.

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