

LEADS DEVELOPMENT MODEL

Sustainable Livelihood Promotion Initiative

Promotion of Irrigation Well for Sustainable Livelihood

Background

Agriculture remains the primary source of livelihood for rural households in Jharkhand. However a significant proportion of farmers depend on rainfed agriculture due to limited access to reliable irrigation facilities. Consequently, farming is often restricted to a single cropping season, resulting in low agricultural productivity, seasonal employment opportunities, and limited household income.



Despite receiving adequate annual rainfall, much of the rainwater is lost through surface runoff due to inadequate water harvesting and irrigation infrastructure. To address this challenge, LEADS has developed a community-based Irrigation Well Promotion Model to provide small and marginal farmers with reliable and sustainable irrigation facilities. The initiative seeks to ensure the availability of water throughout the year, enabling farmers to diversify their cropping patterns, enhance agricultural productivity, and increase household incomes. Irrigation wells are primarily promoted among farmers engaged in orchard development, vegetable cultivation, organic farming, and other livelihood activities that require assured water availability. By providing a dependable irrigation source, the model enables farmers to cultivate multiple crops across seasons, strengthen household food security, and build more resilient and sustainable livelihoods.

Concept

An irrigation well is a scientifically designed water source developed to provide a reliable supply of groundwater for agricultural purposes throughout the year. Depending upon the local hydrogeological conditions, wells are constructed at suitable locations where adequate groundwater is available for sustainable extraction. The irrigation well functions as a long-term community asset, supporting a range of agricultural activities such as field crop cultivation, vegetable production, fruit orchards, kitchen gardens, and nursery development. Where feasible, the water source may also meet the needs of livestock and other household activities. Depending on groundwater availability, landholding patterns, and the irrigation system used, a single well can serve multiple farming households. By ensuring a dependable source of irrigation, the intervention helps increase agricultural productivity and cropping intensity, enables crop diversification, strengthens farmers' resilience to climate-related risks, and contributes to improved and sustainable livelihood security.

Objectives

The Irrigation Well Promotion Model aims to:

- Ensure year-round access to irrigation for small and marginal farmers.
- Increase cropping intensity and agricultural productivity.

- Promote cultivation of vegetables, fruits, pulses, cereals, and other high-value crops.
- Improve household food and nutritional security.
- Enhance farmers' income through diversified agricultural production.
- Reduce dependence on erratic rainfall and climate variability.
- Promote sustainable groundwater utilisation through community management.
- Strengthen community ownership and long-term management of irrigation assets.

Steps in Promotion of Irrigation Wells

Step 1: Identification and Selection of Beneficiaries - The process begins with participatory identification of eligible beneficiaries in consultation with the Gram Sabha, village institutions, and community members. Priority is given to small and marginal farmers, orchard beneficiaries, women farmers, and families practicing organic or diversified agriculture. Potential sites are assessed based on groundwater availability, land ownership, accessibility, and the potential command area that can be irrigated.

Step 2: Technical Survey and Planning - LEADS technical professionals conduct a detailed site assessment to determine the feasibility of well construction. Hydrogeological conditions, expected groundwater yield, soil characteristics, and irrigation potential are carefully evaluated. Based on the assessment, an appropriate design, dimensions, construction methodology, and implementation plan are prepared to ensure the long-term sustainability of the well.

Step 3: Community Mobilisation and Formation of Water User Group - Community meetings are organised to discuss the objectives, expected benefits, roles, and responsibilities associated with the irrigation well. Wherever multiple farmers benefit from a single well, a Water User Group is formed. The group establishes operational rules regarding water distribution, maintenance, conflict resolution, and resource management. Members contribute labour, locally available materials, and financial resources whenever feasible, thereby strengthening ownership and accountability.

Step 4: Construction of Irrigation Well - Construction is undertaken using appropriate engineering standards and quality construction materials. Excavation is carried out to the required depth based on groundwater availability. Depending upon site conditions, the well is lined with stone masonry or reinforced concrete rings to ensure structural stability and prevent collapse. Safety measures and proper drainage arrangements are incorporated during construction to enhance durability and user safety. After completion, the well is tested to verify adequate water availability before being commissioned for agricultural use.

Step 5: Development of Irrigation and Cropping Plan - Following completion of the well, LEADS facilitates the preparation of a seasonal irrigation and crop planning strategy. Farmers jointly identify suitable crops according to water availability, soil conditions, local market demand, and household food requirements. Emphasis is placed on diversified cropping systems, including vegetables, pulses, cereals, spices, and fruit crops. Farmers are also encouraged to adopt water-efficient irrigation practices and improved agronomic techniques to maximise water productivity.



Step 6: Capacity Building and Agricultural Demonstration -

Regular capacity-building programmes are organised to strengthen farmers' technical knowledge on efficient irrigation management, soil moisture conservation, crop planning, integrated nutrient management, pest management, and sustainable

agricultural practices. Demonstration plots are established to promote improved cultivation techniques, quality seed utilisation, organic farming practices, and climate-resilient agriculture.

Step 7: Agricultural Production and Market Linkage - With assured irrigation facilities, farmers cultivate crops throughout multiple seasons, substantially increasing agricultural production. Common crops include paddy, maize, wheat, pulses, mustard, onion, tomato, brinjal, chilli, cabbage, cauliflower, beans, leafy vegetables, cucurbits, banana, papaya, and other locally suitable crops. After meeting household consumption requirements, surplus produce is marketed through local markets, Farmer Producer Organisations (FPOs), and institutional buyers, providing an additional and reliable source of household income.

Benefits to Farmers and the Community

Promotion of irrigation wells generates multiple social, economic, and environmental benefits.

Agricultural Benefits

- Assured irrigation throughout the year.
- Increased cropping intensity from single to multiple cropping.
- Higher agricultural productivity.
- Improved crop diversification.
- Better seed germination and crop establishment.
- Increased adoption of improved agricultural practices.



Economic Benefits

- Increased household income.
- Reduced crop failure due to drought.
- Enhanced employment opportunities within the village.
- Reduced seasonal migration.
- Improved profitability through cultivation of high-value crops.

Social Benefits

- Improved household food and nutritional security.
- Better availability of vegetables and fruits throughout the year.
- Strengthened community cooperation through Water User Groups.
- Increased participation of women in livelihood activities.
- Enhanced resilience of vulnerable farming households.

Environmental Benefits

- Efficient utilisation of groundwater resources.
- Promotion of water conservation practices.
- Improved soil moisture management.
- Reduced land degradation.
- Enhanced climate resilience through sustainable irrigation.

Sustainability

The sustainability of the Irrigation Well Model is ensured through strong community participation, scientific planning, and local ownership. Beneficiaries are responsible for routine maintenance, cleaning, and safe operation of the well. Where wells are shared, Water User Groups establish maintenance funds through nominal user contributions, ensuring resources are available for repairs and upkeep. Farmers



are encouraged to adopt water-efficient irrigation methods, crop diversification, mulching, soil moisture conservation, and groundwater recharge practices to minimise water extraction and maintain long-term groundwater availability. Continuous technical guidance, regular monitoring, and capacity-building programmes further strengthen farmers' ability to sustainably manage the irrigation infrastructure.

LEADS Experience

LEADS has successfully promoted irrigation wells across several villages of Jharkhand under various livelihood development programmes. The intervention has enabled hundreds of farming households to cultivate crops throughout the year, diversify agricultural production, and substantially improve their household income. Beneficiary farmers have adopted vegetable cultivation, orchard development, organic farming, and integrated farming systems using assured irrigation facilities. Beyond agriculture, irrigation wells have also supported livestock management and other domestic water requirements, thereby improving the overall quality of life in rural communities. The experience demonstrates that access to reliable irrigation remains one of the most effective investments for promoting sustainable rural livelihoods and strengthening climate resilience.

Concluding Remarks

The LEADS Irrigation Well Promotion Model provides a practical, affordable, and sustainable solution to one of the major constraints facing smallholder agriculture—lack of reliable irrigation. By ensuring year-round access to water, the model enables farmers to increase agricultural production, diversify livelihoods, improve food security, and build resilience against climate variability. The initiative combines community participation, scientific planning, and sustainable resource management to create durable livelihood assets that continue to benefit farming households for many years. With minimal recurring costs and strong local ownership, the Irrigation Well Model has significant potential for replication across rainfed and resource-poor regions, contributing to long-term agricultural development and rural prosperity.

Photographs

