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Good Governance in Water Users' Associations: A Study of Rani Jamara Kulariya Irrigation Project, Nepal

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Abstract

This study looks at how the Rani Jamara Kulariya Irrigation Project (RJKIP) in Nepal is governed. It uses key good governance ideas like transparency, accountability, participation, effectiveness and responsiveness. RJKIP is Nepal's largest irrigation project run by farmers. It combines modern technology with traditional community groups, especially the Tharu Badghar. The study used interviews, document reviews, and observations to understand the governance system. It found a strong Water Users Association system working with the Badghar, though the Badghar's legal status is unclear. Problems include poor coordination between traditional and formal groups, weak transparency and limited involvement of marginalized people. The study suggests formally recognizing the Badghar, improving cooperation and boosting community participation to make governance stronger and more sustainable. These findings help improve farmer-led irrigation management in Nepal.

Keywords: *Irrigation governance, water management, Badhghar, Water Users Association, good governance*

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Introduction

Nepal's economy remains predominantly agrarian, with agriculture serving as the livelihood base for over one-third of the population and contributing substantially 25.16 to national GDP (GoN, 2081/82). Despite this, agricultural productivity has been constrained by irregular and unreliable rainfall patterns, making irrigation essential for ensuring food security and rural prosperity. Historically, irrigation management in Nepal followed a centralized, state-controlled model through government agencies such as the Department of Water Resources and Irrigation. However, this top-down approach proved inadequate, resulting in poor system maintenance, inefficient water distribution, inequitable access and limited participation of farming communities in decision-making processes.

Recognizing these institutional shortcomings, Nepal initiated a paradigm shift toward participatory irrigation management in the 1990s. This transition emphasized the devolution of management responsibilities to the local communities and the establishment of Water Users' Associations (WUAs) as farmer-led organizations capable of managing irrigation systems at the local level. Government of Nepal had enacted Irrigation Regulation, 1999 to regulate WUAs and mandate to farmer-led irrigation governance. The creation of WUAs represented a critical institutional innovation intended to bridge the gap between government agencies and farmer communities.

The Rani Jamara Kulariya Irrigation Project is participatory approach based project funded by World Bank. The project is located in Sudurupaschim Province, Kailali District. Specific local municipalities are Tikapur and Lamkichuhaa municipalities and Janaki rural municipality. This project was declared national pride project in fiscal year 2067/68 (NPC, 2015). Since the project represents Nepal's largest irrigation system constructed and managed by farmers themselves. The main intake of the canal is located at the Chisapani Karnali River. Project scheme combines three traditional irrigation systems; the Rani System in the lower region, Jamara system in the middle region and Kulariya system in the northern region. These systems have been operated by local communities for approximately 120 years through collaborative efforts, initially using seasonal embankments and temporary canals.

Water Users' Associations serve as critical intermediary institutions between government agencies and farming communities, responsible for water allocation, infrastructure maintenance, fee collection, conflict resolution and coordination with state authorities. In the Rani Jamara Kulariya project, a three-tiered institutional structure has been established comprising the main Water Users' Committee, three branch committees; one for each sub-system and 48 sub-branch committees distributed across the command area. This organizational architecture enables both centralized coordination and localized management suited to specific hydraulic conditions.

However, many WUAs in Nepal struggle with significant institutional constraints including limited financial resources, inadequate technical capacity, insufficient training and difficulty sustaining active farmer participation. These challenges directly compromise irrigation system performance and farmer livelihoods. The Rani Jamara Kulariya project, despite its scale and ambition, faces similar obstacles in translating participatory governance principles into effective institutional practice.

Integration of Indigenous Institutions and Good Governance Principles

A distinctive feature of the Rani Jamara Kulariya project is its integration of the Badghar, a traditional institution of the Tharu indigenous community, into formal water users' committee structures. The Badghar, historically a democratically elected annual leadership position. It has long served crucial roles in organizing community religious ceremonies, marriages, dispute resolution and collective works. Its involvement in irrigation management represents an attempt to ground formal governance structures in existing social institutions and cultural practices.

However, the formal incorporation of Badghar into the project's governance framework remains ambiguous and underutilized. Currently, the Badghar lacks clearly defined institutional status and formal responsibility in irrigation system management. The Badhgar is indigenous institution which is culturally legitimate institution. This institution can support WUA mechanism to operate sustainable irrigation governance in the community level.

Underlying these institutional arrangements there are fundamental good governance principles; transparency, accountability, participation, effectiveness and responsiveness. These principles are essential for ensuring that irrigation systems deliver equitable water distribution, sustainable resource management and improved farmer livelihoods. Transparency in water allocation and financial management builds trust and reduces user conflicts. Accountability mechanisms ensure WUA leadership acts in members' interests. Inclusive participation broadens decision-making legitimacy and incorporates diverse perspectives. Effectiveness ensures operational objectives are achieved efficiently, while responsiveness enables adaptation to changing environmental and social conditions.

Objectives of the Study

This study examines good governance practices in the Rani Jamara Kulariya Irrigation Project. The specific objectives are;

(1) Analyze the governance structures and institutional arrangements of the RJKIS from the perspective of good governance principles.

(2) Identify challenges and opportunities in achieving sustainable community-based irrigation management.

(3) Examine how traditional institutions (Badghar) are integrated into modern irrigation management systems.

(4) Provide recommendations for strengthening governance mechanisms in community-based irrigation systems.

The Rani Jamara Kulariya project, as Nepal's largest farmer-managed irrigation scheme involving a World Bank-supported modernization program, represents a critical case for understanding participatory irrigation governance at scale. Findings provide empirical evidence on governance-performance linkages that can inform national irrigation policy and institutional reform initiatives. By identifying barriers to and enablers of good governance, the study offers actionable strategies for government agencies, development

practitioners and farmer organizations working to strengthen WUA institutional capacity and sustainability.

Literature Review and Theoretical Framework

The transition from centralized, state-managed irrigation to participatory management represents a significant paradigm shift in water resource governance in the 1980. Local communities can effectively manage common-pool resources, including water, when appropriate institutional arrangements are in place (Ostrom, 1990).

Good governance in water resource management encompasses several key principles: transparency, accountability, participation, efficiency and responsiveness. Governance extends beyond government institutions to include networks of stakeholders who collaborate in managing public resources (Bevir & Rhodes, 2003). In the context of irrigation systems, good governance requires balancing the interests of water users, government agencies and environmental stakeholders.

In Nepal's context, the shift toward participatory irrigation management was formalized through policy reforms and legislative frameworks. The Irrigation Policy, 1992, Water Resources Act, 1992 and Ninth Five-Year Plan, 1997-2002 explicitly endorsed the devolution of irrigation management responsibilities to Water Users' Associations. This institutional innovation reflected both international development discourse emphasizing participation and equity and domestic political movements advocating for local governance and democratization.

WUA functionality varies significantly based on factors including local institutional capacity, user heterogeneity, and external support and pre-existing social capital (Lam, 1998). Some WUAs have achieved impressive results in water distribution equity, financial sustainability and infrastructure maintenance (Vermillion & Garces, 2002). Some of the WUAs largely dysfunctional institutions operating primarily on paper (Joshi et al., 2000).

WUAs embedded in broader governance systems function more effectively than isolated organizations (Meinzen et al., 2002). Linkages to government agencies, local government bodies, farmer networks and development organizations significantly enhance WUA sustainability and performance (Koppen et al., 2009).

Indigenous Institutions and Formal Governance Integration

(Dietz et al., 2003) and (Acheson and Breton, 2010) argue that governance systems incorporating multiple institutional levels and types-combining formal statutory institutions with customary and community-based organizations demonstrate greater adaptive capacity and legitimacy than those relying on single institutional forms.

Badghar has important role in traditionally community to in organize functions including dispute resolution, ritual practices and collective labor mobilization (Chaudhary, 2019). The Badghar system represents a customary institution deeply rooted in Tharu cultural practices. Research on indigenous institutions in South Asia (Agrawal & Narain, 1997) shows that such systems have historically managed common resources effectively and possess intrinsic legitimacy among community members. Integrating these institutions into modern governance frameworks requires careful navigation to preserve their cultural significance while enhancing operational effectiveness.

Governance Frameworks

UNDP defines governance as a multidimensional process covering political, economic and social aspects. Key dimensions of good governance include: Participation & inclusiveness, transparency, accountability, effectiveness, equity and rule of law.

World Bank focuses on irrigation governance through institutional capacity, financial sustainability, service delivery, stakeholder engagement and legal/regulatory clarity.

Asian Development Bank (ADB) emphasizes accountability, transparency, participation, efficiency, equity and institutional sustainability, reflecting UNDP and World Bank principles tailored to Asian contexts.

Across UNDP, World Bank and ADB frameworks, six core governance dimensions for governance emerge: participation, transparency, accountability, equity, effectiveness and responsiveness.

Methodology of the Study

Research Design

In this study a qualitative research methodology, combining case study and exploratory design has been employed. The case study approach allows for deep investigation of governance dynamics within a specific, bounded context (Yin, 2014). This methodology is particularly suitable for examining complex governance arrangements and stakeholder relationships.

Data Collection Methods

To collect data, semi-structured 20 interviews have been conducted with key stakeholders. Those were project implementation office staff (engineers, irrigation specialists, and sociologists), water user committee members at primary, branch and sub-branch levels, Badghar representatives, community members and farmers, district coordination officials and government irrigation specialists.

Interviews explored perceptions of governance effectiveness, institutional roles, participation mechanisms, decision-making processes and challenges encountered.

Document Analysis was another tool to collect data such as relevant project documents were reviewed, including project Implementation Manual, water user committee bylaws and meeting minutes, progress reports and monitoring evaluations and government policy documents on community-based irrigation.

Observation was also employed as a data collection tool in this research. During observation water user committee meetings, Badghar gatherings and

decision-making processes, irrigation system operation and maintenance activities and dispute resolution mechanisms were observed.

Sampling Strategy

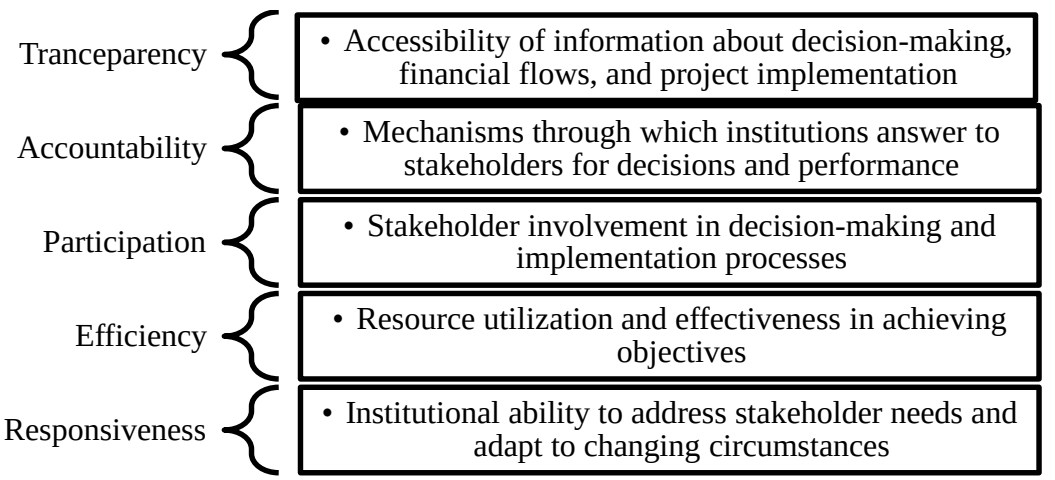
A purposive sampling approach was employed to select participants with direct knowledge and involvement in the scheme's governance. Stratified purposive sampling ensured representation across the different hierarchical levels such as main committee, branch, sub-branch, settlement level.

Data Analysis

Thematic analysis was employed through transcription and familiarization with interview data. Code development inductively from data and informed by good governance literature. Systematic coding using qualitative analysis. Souping related codes into governance-relevant themes. Pattern recognition identifying relationships between themes. Triangulation across multiple data sources

Analytical Framework

This study analyzes governance through five dimensions:



Fuger 1: Analytical Framework

Data Presentation and Analysis

Project Context and Geographic location

The Rani Jamara Kulariya Irrigation Scheme modernizes three traditional community-managed irrigation systems operating for approximately 120 years. The command area of the project is Tikapur and Lamkichuha Municipalities and Janaki Rural Municipality of Kailali District. The potential irrigation covers the area of 14,300 hectares expanding to 38,300 hectares upon completion. The infrastructure is 52 km main canal, 125 km branch canals, 700 km sub-branch canals in total. 4.71 MW hydropower generation, flood control, enhanced food security are the additional benefit from the project. Total investment is NPR 27.70 billion jointly Nepal Government and World Bank funding. Implementation Phases of the project is, phase 1: October 2011 to September 2018 completed with World Bank support and phase 2: July 2018 to July 2025 ongoing with expanded scope.

Historical Context

For over 120 years, the three irrigation systems operated using seasonal, temporary infrastructure that required annual reconstruction. Temporary dams made of wood, stone and soil were highly vulnerable to monsoon floods, which frequently destroyed intake structures and necessitated significant labor for their repeated rebuilding. Each system was managed independently with separate intake points, limiting coordination and operational efficiency. Critical environmental impacts were issues such as sudden flood penetration damaged canal structures, sand deposition reduced channel capacity and agricultural lands suffered erosion and crop losses. Settlements within the command areas were also vulnerable, facing mobility constraints during floods. Operationally, water availability was inconsistent, distribution control was limited and maintenance demands placed heavy labor burdens on farming communities. The inability to protect command areas from flood damage further constrained agricultural productivity. These persistent challenges prompted government intervention beginning in fiscal year 2006/07, ultimately

leading to the designation of the Rani Jamara Kulariya Irrigation System as a national pride project.

Institutional Structure and Multi-Level Governance

The Rani Jamara Kulariya Irrigation System (RJKIS) operates through a layered institutional structure to coordinate technical, agricultural, environmental and social functions. At the central level, the Project Implementation Office in Tikapur is led by a First-Class Irrigation Officer and staffed with irrigation engineers, agricultural irrigation specialists, sociologists and technical officers, complemented by an international technical support team including engineers and environmental and social specialists. The office receives external oversight through regular World Bank missions and technical reviews. The Agricultural Component Implementation Unit, also based in Tikapur, is led by a Second-Class Nepal Agricultural Service Officer and supported by agricultural extension technicians, providing services such as farmer training, improved seed distribution, tool provision and greenhouse establishment. Environmental and social safeguards are managed by a District Coordination Coordinator-led Monitoring Committee, composed of government agencies, NGO representatives and community leaders, responsible for infrastructure monitoring, ensuring compliance with environmental standards and addressing grievances. A formal grievance management system operates across settlement, branch and project levels, covering multiple complaint categories during infrastructure development and ensuring community concerns are escalated to the appropriate resolution.

Water User Committee Hierarchy

The Rani Jamara Kulariya Irrigation system (RJKIS) operates through a structured Water Users' Committee system that organizes stakeholders across multiple levels.

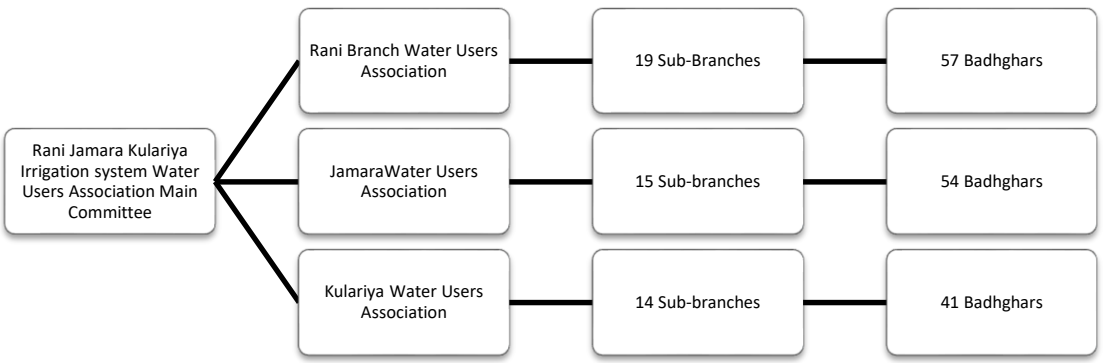


Figure 2: Water User Committee in Multi-level

At the primary level, the RJKIS Water User Institution serves as the main coordinating body. The secondary level comprises three branch committees- Rani (19 sub-branches), Jamara (15 sub-branches) and Kulariya (14 sub-branches) totaling 48 sub-branch entities representing local community settlements.

At the settlement level, the Badghar institution, a traditional Tharu community leadership system, operates as a customary governance structure. Historically, the Badghar played a central role in social, cultural and irrigation-related functions. Badhghars leading ceremonies, resolving disputes, mobilizing labor for collective works, managing seasonal embankments, coordinating water carriers, protecting command areas from floods and overseeing community-level irrigation operations. In the traditional irrigation system, Badghars organized labor for seasonal intake structures, distributed water among farming families, resolved allocation disputes and led community responses during flood emergencies. In the modernized RJKIS, Badghar integration is partial, representatives participate in annual general meetings of primary and branch committees, handle settlement-level grievance management and

engage in infrastructure and flood protection planning. However, they lack formal legal status within WUA bylaws, defined hierarchical authority and direct operational control at the sub-branch level, resulting in operational ambiguity. Comparative developments in neighboring jurisdictions, such as the enactment of Badghar Acts in Bardia and Kanchanpur municipalities, offer models for formal recognition. The Budhgar act enacted in the neighboring municipalities' present opportunities to clarify legal status and align traditional modern governance in Tikapur and Lamkichuha and Janaki Rural Municipalities.

Completed Infrastructure Development

The Rani Jamara Kulariya Irrigation modernization has achieved substantial infrastructure and operational improvements. Completed works include permanent intake structures, main and feeder canals (e.g., Kulariya off-take), associated structures, a 4.71 MW hydropower facility and the Lamkichuha expansion with 14.65 km of main canal. Infrastructure is largely complete or in advanced stages, with Phase 2 targeted for July 2025. Modernization has enhanced structural stability by replacing annual temporary constructions, constructing river embankments and boulder structures to reduce flood vulnerability and protecting command areas from crop and settlement damage.

Operational efficiency has improved through gated control systems, professional gate operators, precise water distribution and reduced emergency repairs. Maintenance demands have declined, with seasonal cleaning still required but labor-intensive emergency interventions minimized. Beyond irrigation, the scheme delivers multi-purpose benefits: reliable water supply supports extended or year-round cultivation and crop intensification, agricultural extension services provide improved techniques and inputs, hydropower generation contributes 4.71 MW to the national grid and potential revenue for system maintenance, river embankments mitigate flood risks and expanded irrigation coverage of 38,300 hectares strengthens food security and rural economic development.

Integration of Traditional and Modern Institutional Systems

The Rani Jamara Kulariya Irrigation System (RJKIS) set an example of institutional pluralism by blending traditional and modern governance structures. Traditional elements include the Badghar leadership, democratically selected annually, Tharu cultural practices for community mobilization, over 120 years of historical water management experience, social legitimacy and customary dispute resolution mechanisms. Modern elements encompass formal water user committees with documented bylaws and registered at RJKIP office. Professional engineering and technical management, adherence to international technical standards, operational manuals and external monitoring and evaluation systems. Together, these elements create a hybrid governance framework; however, integration remains partial, as the Badghar lacks formal legal status within the modern organizational hierarchy.

Challenges in this integration arise from institutional ambiguity, as the Badghar's settlement-level functions are undefined within the formal structure, with unclear authority distribution between Badghar and sub-branch committees and potential conflicts between customary and modern management practices. Capacity transition issues also persist, with communities customed to 120 years of seasonal, labor-intensive embankment maintenance needing to adapt to professionally-managed permanent infrastructure and gated water distribution systems.

Opportunities for formalization exist through proposed municipal-level Badghar Acts in Tikapur, Lamkichuha and Janaki municipalities. These Acts could formally recognize Badghar roles in irrigation management, clarify legal status and authority relationships. Precedents in Bardia and Kanchanpur demonstrate that formal legal recognition can successfully preserve traditional institutions while enabling their effective integration into contemporary governance systems.

Good Governance Assessment across Five Dimensions

Dimension 1: Transparency Assessment

The RJKIS transparency is moderate to developing. Strengths include formal documentation in the Project Implementation Manual. Technical and engineering plans are available at the project office. Multi-stakeholder committees enable information sharing and government investment is publicly disclosed. The World Bank provides external scrutiny through supervision and progress reviews.

However, transparency gaps exist at the community level. Water allocation criteria are unclear. Financial flows and budget utilization are not uniformly communicated to the settlements. Water user committee decision-making is inconsistently documented. Project documentation concentrates at the project office. Stakeholder understanding of technical decisions is not systematically ensured.

Community-accessible information systems like notice boards or village meetings should be established and publicly disclosed. Technical plans need translation into community-understandable formats like local language. Project progress and financial information should be shared regularly. Community feedback mechanisms should be developed to monitor transparency adequacy.

Dimension 2: Accountability Assessment

Accountability within the RJKIS is partially established. Strengths include external oversight by World Bank missions. A grievance management system extends from settlement to project level. A multi-stakeholder local environmental monitoring committee exists. The hierarchical structure enables accountability flows between levels. Annual water user committee meetings provide stakeholder interfaces. Settlement-level grievance responsibility is delegated to Badghar.

Nonetheless, significant gaps remain. Badghar's institutional accountability status is undefined. Consequences for non-compliance are not specified. Grievance resolution timelines are not systematically documented at settlement level. Downward accountability from the project office to the

community is limited. Financial and resource allocation accountability at sub-branch level is unclear.

Recommended enhancements include developing explicit accountability frameworks. These should define responsibilities at each governance level. Grievance tracking systems with documented timelines should be established. Consequences for non-compliance should be specified through institutional procedures. Regular progress reporting from the project office to water user committees should be maintained. Financial disclosure and auditing systems should be implemented across multiple levels. Communities should be involved in monitoring progress toward stated project objectives.

Dimension 3: Participation Assessment

Participation in RJKIS governance is structured but variable in quality. The hierarchical water user committee system includes 48 sub-branch committees. This enables multi-level participation. Badghar representation recognizes traditional institutions. Agricultural extension programs engage beneficiary farmers. Grievance management systems facilitate community voice. The environmental monitoring committee incorporates multi-stakeholder participation. Annual water user committee meetings provide formal opportunities for involvement.

However, participation is often consultative rather than decision-making at the community level. Women's representation is neither explicitly documented nor prioritized. Marginalized groups lack defined inclusion mechanisms. Badghar authority in decision-making is insufficient relative to traditional influence. Information asymmetry persists between technical professionals and community members.

Enhancements should include establishing clear participation standards. These should distinguish consultation from decision-making. Minimum quotas for women and marginalized groups should be mandated. Capacity-building programs should be implemented to strengthen effective community engagement.

Dimension 4: Efficiency Assessment

The RJKIS demonstrates notable improvements in efficiency, primarily through infrastructure modernization and resource utilization. Permanent intake structures and modern gated control systems have replaced labor-intensive seasonal temporary dams. This substantially reduces reconstruction efforts. It also enables precise water distribution. Professional gate operators and trained technical staff enhance operational management. Multi-purpose infrastructure maximizes benefits. It combines irrigation, hydropower generation and flood control.

Investment efficiency is significant. The NPR 27.70 billion project serves 38,300 hectares. This equals approximately NPR 7.2 million per 100 hectares. World Bank co-financing reflects institutional confidence in project viability. Agricultural productivity has improved through extension services. These provide training, improved seeds and input support. Crop intensification is now possible under reliable water supply.

Despite these gains, challenges persist. Long-term sustainability of extension services remains uncertain. Sub-branch level operational and maintenance funding mechanisms are not fully defined. Community transition from traditional temporary systems to professionally-managed modern systems requires capacity building. System performance indicators and monitoring frameworks are not explicitly documented. This potentially limits evidence-based operational improvements.

Overall, RJKIS demonstrates high operational and investment efficiency. However, governance mechanisms supporting sustainable management and performance tracking require strengthening.

Dimension 5: Responsiveness Assessment

The RJKIS exhibits strong responsiveness to historical and contemporary community needs. It particularly addresses century-old challenges faced by Tharu farming communities. Permanent intake structures and engineered river

embankments directly replace annual reconstruction of temporary dams. This reduces labor burdens. It protects crops and settlements from flood damage. It ensures more predictable water availability.

The integration of gated control systems and professional management enhances operational responsiveness. This allows timely water distribution. It reduces emergency repairs. Community-focused mechanisms enable stakeholder participation in system operation and maintenance. These include settlement-level grievance management through Badghar representation. They also include agricultural extension services and water carrier coordination.

These include phase-wise implementation, international technical expertise and environmental monitoring committees. They enable responsiveness to local concerns.

Nevertheless, gaps remain. Badghar legal recognition is delayed. Community feedback mechanisms for system modifications are not fully articulated. Adaptation strategies for climate variability or changing water demand are not explicitly addressed.

Overall, RJKIS demonstrates substantial responsiveness to stakeholder needs. However, sustained effectiveness requires formalization of traditional institutions. It also requires clearer feedback channels. Mechanisms to address evolving environmental and social challenges are needed.

Results and analysis

The RJKIS has a multi-level governance system involving national ministries, project units, extension services, water user committees, environmental monitors and traditional Badghar institutions. This reflects integrated resource management and multi-stakeholder participation. World Bank involvement and multiple ministries ensure alignment with international standards. The water user committee system follows subsidiarity, making decisions at the right level.

However, Badghar's lack of formal recognition creates uncertainty. Clear role definitions and coordination are needed. Municipal Badghar Acts could formalize these institutions and improve governance.

The partial integration of Badghar shows both recognition of indigenous governance and challenges of institutional pluralism. With over120 years of Tharu experience, Badghar supports embankment work, water coordination, and dispute resolution and community mobilization. These roles help modern irrigation but without formal authority, their potential is limited. Neighboring areas like Bardia and Kanchanpur show that legal recognition can strengthen traditional institutions and governance.

RJKIS infrastructure modernization solves century-old community problems. Permanent intakes, gated controls and engineered embankments replace annual temporary systems. This reduces vulnerability, protects crops and ensures reliable water supply. But infrastructure alone is not enough. Good governance also needs transparent decisions, professional management and community capacity building.

RJKIS is multi-purpose: irrigation (38,300 ha), hydropower (4.71 MW) and flood control. This maximizes benefits, but competing interests among farmers, electricity users and residents require strong governance for water allocation, priorities, revenue sharing and conflict resolution. Without clear policies, stakeholder conflicts may arise.

Agricultural extension services training, seeds, tools, and greenhouses show governance responsiveness. Irrigation alone does not guarantee productivity; these services fill knowledge gaps and boost effectiveness. But their long-term sustainability is uncertain without clear institutional and financial arrangements.

Despite progress, RJKIS faces governance gaps. Badghar's status and sub-branch authority remain unclear. Performance monitoring, documentation, grievance tracking and financial transparency are weak. Women and marginalized groups have limited representation and access to information.

Formal frameworks, accountability and monitoring are needed to turn good governance into practice.

In summary, RJKIS shows the benefits of multi-level, pluralistic governance blending tradition, technical expertise and participation. But sustainable, equitable governance requires legal clarity, institutional coherence, performance monitoring and inclusive engagement.

Conclusion

The Rani Jamara Kulariya Irrigation Project demonstrates the potential of integrating traditional indigenous institutions like the Badghar with modern water governance structures to achieve effective, participatory irrigation management. While the project shows significant progress in infrastructure modernization, multi-level governance and stakeholder participation, critical challenges remain. These include unclear legal status of the Badghar, limited coordination with Water Users' Associations, gaps in transparency, accountability and inclusion of marginalized groups. Addressing these governance gaps through formal recognition of traditional institutions, clearer accountability frameworks and enhanced community engagement is essential for sustainable and equitable water management. This study underscores that good irrigation governance relies not only on technical improvements but on cohesive, inclusive and adaptive institutional arrangements that respect both cultural legitimacy and modern management demands.

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