

**PROJECT INFORMATION DOCUMENT (PID)  
APPRAISAL STAGE**

Report No.: AB6519

<b>Project Name</b>	Modernization of Rani Jamara Kulariya Irrigation Scheme - Phase 1
<b>Region</b>	SOUTH ASIA
<b>Sector</b>	Irrigation and drainage (76%); Flood protection (15%); General agriculture, fishing and forestry sector (9%)
<b>Project ID</b>	P118179
<b>Borrower(s)</b>	FEDERAL DEMOCRATIC REPUBLIC OF NEPAL
	Ministry of Finance Singhdurbar Kathmandu, Nepal Tel: 977-1-4-259820
<b>Implementing Agency</b>	
	Department of Irrigation Jawlakhel Lalitpur Kathmandu, Nepal Tel: (977-1) 553-5382 Fax: (977-1) 553-7169
<b>Environment Category</b>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> FI <input type="checkbox"/> TBD (to be determined)
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## 1. Country and Sector Background

1. Nepal has a largely agrarian economy with low labor productivity. Agriculture contributes 33 percent to the Gross Domestic Product (GDP) and it employs about 80 percent of the rural labor force. Real GDP grew between 2001 and 2006 on average about 2.7 percent per annum. Official estimates suggest that real GDP grew by 4.6 percent in FY10 (Central Bureau of Statistics (CBS) Nepal, 2010) with the per capita GDP at US\$562. Despite the difficult political situation, the incidence of poverty fell from 42 to 32 percent between 1995 and 2004 (CBS, 2005). More recent estimates show that since 2004 the national poverty rate has declined by another 10 percentage points (World Bank, 2010). The incidence of poverty in rural areas declined from 43 percent to 35 percent. However, the percentage of the population living on less than US\$1.25 a day remains high at 55 percent (ADB, 2009). Despite these positive developments, Nepal still faces the dual challenges of further accelerating domestic growth and sharing this growth more broadly across the population. Agriculture has made only a modest contribution to improved living standards, which is in large part due to the poor performance of the crop sector. The level of income from agriculture is low by international standards. Yields of the major cereal crops produced in Nepal are still well below potential in many areas and need to be improved. Farmers are generally unable to

benefit from existing modern technologies and inputs. Therefore, a pressing priority in this regard is to improve agricultural productivity and foster diversification toward high-value products. Moreover, water use efficiency remains low in irrigation schemes.

2. Government recognizes the lack of intensive cropping, inadequate supply and use of basic agricultural inputs such as fertilizer and improved seeds, and problems with deteriorated and inefficient irrigation systems. Nepal's agricultural sector has become increasingly vulnerable in recent years due to erratic monsoon rains. Farmers are being doubly affected by unreliability in the onset of the monsoon season and uneven rainfall pattern and intensity, with both droughts and high intensity rainfall, being observed during the season. Efficiently operated and managed irrigation systems are of critical importance to the transformation and growth of the agricultural sector. Only by enhancing water control and management will complementary investments take place in improved seeds, modern inputs and agronomic practices, and markets and market-related activities which, together, will raise crop yields, cropping intensity, and farm incomes.

3. Irrigation is thus a critical input into agriculture both during the monsoon season to overcome periods of dry spells and during the dry season when rainfall is negligible. Irrigation systems in Nepal fall under four different categories: (a) traditional farmer managed irrigation systems (FMIS) developed and managed by the communities; (b) systems developed with full or partial support of the government; (c) government developed tube well irrigation schemes; and (d) individually owned and operated tube wells and pumps (mostly utilizing shallow aquifers, streams, ponds, and dug wells).

4. The strategy and vision for irrigation development and management in Nepal is reflected in the Nepal Water Resources Strategy (2002), National Water Plan (2005), and the Irrigation Development Vision and Action Plan (2006). The main vision described in the strategy and plans is to integrate agriculture and irrigation development in order to realize the full benefits from investment in irrigation and provide sustainable services to the agriculture sector through well-operating and well-managed irrigation facilities, based on local resource mobilization through a partnership of the users and the government.

5. Nepal has a long tradition of farmer-managed irrigation systems in the hills, mountains, and the Terai. The FMISs cover about 70 percent of the 1.2 million ha of irrigated land in the country. The hill FMISs are generally small in size compared to medium to large irrigation systems in the Terai. A strong sense of ownership and hierarchical management system exists in these systems and farmer organizations are typically strong and dedicated to rural development. Farmers are accountable for operation and maintenance (O&M) of the schemes, most of which is done through labor contributions.

6. The improvement of irrigation services in the existing command areas of FMISs needs to be addressed through a combination of both "hardware" and "software" solutions. The former involves rehabilitating/modernizing existing irrigation and drainage infrastructure to improve reliability of supply and expand the system of secondary and tertiary canals. The latter requires the development of more efficient

mechanisms for delivery and management of irrigation systems up to the field level through a clear delineation of responsibilities between the government and the WUAs that are in charge of delivering irrigation services to farmers. There is also the need to pool funding through government and users contributions for O&M and asset replacement over time.

## **2. Objectives**

7. Bank support for the Modernization of the Rani Jamara Kulariya Irrigation Scheme is proposed in two phases. Phase 1 (which is being discussed here) will mainly focus on modernization of the higher-order irrigation infrastructure (especially intakes and feeder and branch canals), enhancing the capacity of the WUAs to operate and maintain the improved or new irrigation infrastructure, and the preparation and initiation of an agricultural development program. Phase 2 would mainly focus on the modernization of the lower-order irrigation infrastructure (sub-branch and tertiary canals and water courses), continuation of the WUA development, and implementation of a comprehensive agricultural improvement program. With good performance of implementation of the first phase, phase 2 could start around January 2014, i.e. about two years after the start of phase 1, so that there would be maximum overlap of the two phases.

8. The development objective of the phase 1 project is to improve irrigation water delivery to and management in the project's command area. This will be achieved through improving the performance of the irrigation systems and strengthening community-based irrigation management. These improvements are essentially about building resilience through good water delivery and management against water-induced hazards such as droughts, floods, and changes in water availability during the agricultural seasons. There will be some support to agricultural development that will result in modest increase in yields in especially the top part of the command area, but the main aim of the support to agriculture during phase 1 is to prepare for a comprehensive agricultural program to be implemented during phase 2 of the modernization of the scheme. The reason for this is that during phase 1 there will be no investments in the lower-order irrigation infrastructure and command area development which make it premature to develop a full agricultural modernization and improvement program for which reliable water availability has to be ensured.

9. The key outcome indicators are:

- Irrigation service delivery by service providers (WUAs) assessed as satisfactory by water users (measured in percentage of water users);
- Resources generated by water users for the operation and maintenance of the modernized irrigation systems (measured in percentage of required resources);
- Increase in irrigated crop yields of main crops rice, wheat, and maize (measured in tons/ha); and
- Number of female and male water users (defined as member of the WUA) provided with improved water delivery services: (i) number of female water

users; and (ii) number of male water users (IDA core indicator). In addition, the sub-indicator of the percentage of female WUA executive committee members will be measured.

### **3. Rationale for Bank Involvement**

10. Given the Bank's long-standing role in the development of Nepal's irrigation and water resources sector, including in command area development and rehabilitation and modernization of higher-order irrigation systems, as well as developing WUAs and transferring improved agricultural technologies to farmers, there is strong GoN interest in the Bank's continued engagement with irrigation projects in Nepal. The Bank's funds and knowledge for the further development of one of the largest FMISs in the country would be a next step in Bank support. Its involvement is seen as crucial in addressing food security aspects in one of the poorer parts of the country. Bank support for this project would also help in building synergies with other Bank operations mentioned above.

### **4. Description**

11. One of the most prominent FMISs in the Terai is the Rani Jamara Kulariya Irrigation Scheme, with a cultivable command area (CCA) of 14,300 ha, but currently irrigating about 11,000 ha. The scheme was developed by the farmers between 1896 (Rani System) and 1915 (Kulariya System). It constitutes three independent traditional irrigation systems constructed, operated, and managed by the farmers, mainly comprising people from the indigenous Tharu community. The scheme is located in Kailali District of the Far Western Development Region.

12. The scheme lacks all necessary infrastructure such as permanent intake and control structures, drop structures, protection works, cross drainage structures, and escape structures. The scheme suffers from frequent wash-out of temporary diversion works made by WUAs at the intake area and erosion of canals from uncontrolled intake of water. As a result, typical problems include difficulty of coping with changes in the river morphology and diverting water to the irrigation systems during low river flows; uncontrolled flooding affecting the scheme during high river flow events; sedimentation of canals; inability to manage the water equitably and efficiently; and poor road connections that often become inaccessible during the monsoon season. In order to improve this situation, the irrigation and drainage systems require substantial rehabilitation and modernization and training of WUAs will be needed to improve their ability to manage the water and maintain the infrastructure.

13. Eighty percent of the land holdings is less than one ha, and the average land holding is about 0.6 ha. About 25,000 households, comprising some 157,000 people, will benefit directly from the project. The ethnic composition of the project area includes the Tharu as the dominant group with 48 percent of the population. Other main groups are Chhetri (17 percent), Dalits (15 percent), Brahman (10 percent), and Magar (3 percent).

There are three WUAs, one for each of the main systems, and there is one central committee (WUA Federation) that links the three systems together.

14. *Component 1: Scheme Modernization.* The scheme modernization will consist of: (i) construction of a feeder canal to link the three main canal systems; (ii) rehabilitation and modernization of Rani (20 km), Jamara (16 km), and Kulariya (16 km) branch canals, mainly focusing on intake structures, control structures, diversion structures, and canal bank protection; (iii) command area protection works against flooding from adjacent rivers such as Karnali, Mohana, and Patharaiya; and (iv) improving and upgrading about 60 km of roads and construction of bridges and culverts. The component will also finance engineering consultants to assist the Department of Irrigation (DoI) and the WUAs with the remaining design tasks and especially third-party construction supervision and quality assurance, as well as with specific tasks such as necessary engineering studies for the preparation of the Phase 2 project.

15. *Component 2: Strengthening Water Users Associations.* The component will strengthen WUAs to assume full responsibility for the modernized infrastructure. This will require different skills than the WUAs currently have, as the O&M will have to be carried out in a more professional manner. Most of the current experience of the WUAs is in mobilizing members to carry out certain cleaning works. After modernization of the infrastructure a different type of management is needed. WUAs will be trained in such aspects as the development and implementation of adequate O&M plans, setting of irrigation service fees, maintenance of records and accounts, participatory monitoring, and optimizing the higher-order system water management for the benefit of all users. In particular, the project will finance: (i) training and support to WUAs, to be carried out by DoI, assisted by specialized consultants and/or NGOs; (ii) construction of WUA offices in a central location of each of the WUA command areas; (iii) office equipment; (iv) motorcycles, O&M equipment, and funds for the annual excavation of the Jarahi Nala Channel for diversion of water from the Karnali River; (v) farmers study tours to successful WUAs, e.g. Kankai WUA that is being supported under IWRMP; and (vi) consulting services for special studies, e.g. to determine the actual cost of O&M.

16. *Component 3: Agricultural Production Support.* The component will carry out a series of agriculture production support activities in the project area through demonstrations, farmers' field schools, and other adaptive processes. The component will also carry out several strategic studies on the options for agriculture diversification, value addition, and institutional innovations that can be promoted during phase 2 of the project. It is stressed that the main gains in production increases, diversification of cropping patterns, and assistance to improve the marketing of crops will be made under phase 2 when the command area gets improved. The following set of specific activities will be undertaken under the project: (i) implementation of demonstration plots and adaptive research; (ii) organizing farmers' field schools; (iii) development of packages for the promotion under phase 2 of integrated pest management and integrated plant and soil nutrient management practices; (iv) strengthening the Agriculture Service Center (ASC) and Agriculture Contact Points (ACP) that are located within the project areas; (v) initiation of support to the production of high quality certified seeds through

identification and training of interested private contract farmers and community-based seed producing entities; and (vi) capacity development of farmer groups and partner staff in various skills as identified per capacity needs assessments.

17. *Component 4: Project Management.* The component will support overall project management, monitoring and evaluation (M&E), and reporting. A project implementation office (PIO) with a project manager and necessary technical and support staff has been set up in Tikapur to manage and coordinate the project activities under components 1 and 2 on behalf of DoI. Component 3 will be managed and coordinated by the District Agricultural Development Office (DADO). The teams are to ensure smooth implementation of project activities, monitoring of project implementation progress and outputs/outcomes achieved, learning from project experiences, communication management, implementation of good safeguard practices, and procurement and financial management. Activities to be financed under the project include, but will not be limited to: (i) the operation of the PIO and a small liaison office in Kathmandu for coordination with DoI, Department of Agriculture (DoA), Ministry of Finance (MoF), and other relevant agencies; (ii) design and establishment of a project specific Management Information System (MIS); (iii) project monitoring, evaluation, and learning, including the services of independent M&E organizations for surveys and other monitoring tasks; and (iv) documentation of project experience and its dissemination in the wider development community.

## 5. Financing

Source:	(\$m.)
BORROWER/RECIPIENT	5
International Development Association (IDA)	43
Local Communities	1
Total	49

## 6. Implementation

18. The Department of Irrigation will have the main responsibility of implementing the project. The PIO will be the main office for the day-to-day management and implementation of the project. The PIO will be headed by a Project Manager who will be assisted by staff in Social, Environment, and Institutional; Technical; Procurement; and Financial Management Units.

19. The agriculture program will be implemented by DADO in Kailali. While the head of DADO will be responsible for guiding the agricultural component of the project, the day-to-day management of the component activities will be done through the ASC in Tikapur that is staffed with Junior Technicians (JT). In order to maintain coordinated planning and implementation of planned activities and to ensure coherence, PIO will make available office space for a DADO nodal officer at its Tikapur office. The project will fund consultants as appropriate to assist the staff of the ASC and others with the implementation of the component. There are at the moment two ACPs within the project

area that are supported by ASC, Tikapur. These ACPs will bring extension services and farmers closer together, in addition to serving as information hub.

## **7. Sustainability**

20. Sustainability is a core project principle and has been factored into project design through the following design features and/or expected measures.

21. *Institutional Sustainability.* WUAs will assume O&M responsibility during project implementation and post implementation. WUA committees shall be permanent elected entities under the charter of WUA constitution. Roles and responsibilities of DoI and WUA will be specified by an agreement between these parties.

22. *Financial Sustainability.* WUAs will collect irrigation service fees for O&M purposes. Project interventions that enhance irrigation-based livelihoods will eventually raise water productivity and hence strengthen the incentive to pay fees. Training will be provided to WUAs on financial management and indicators will monitor the level and collection rates of the fees and WUAs' maintenance of financial records.

23. *Technical Sustainability.* Training will be provided to WUAs to carry out routine O&M. Scheme operation and maintenance plans will list activities to be carried out as part of routine O&M. A memorandum of understanding (MoU) will be signed between WUA and DoI prior to undertaking scheme implementation activities which will commit government to providing certain technical support services.

## **8. Lessons Learned from Past Operations in the Country/Sector**

24. The following lessons learned from evaluation of Bank-supported and other donor supported projects in Nepal and from stakeholder workshops and beneficiary impact analysis carried out during project preparation have been incorporated in the design of this project.

25. *Transparency and accountability in performance management and service delivery in irrigation systems.* To overcome chronic problems of poor maintenance and inadequate service delivery in irrigation schemes it is important to have a clear agreement between WUAs and DoI about respective roles and responsibilities, proper financing arrangements, and transparency and accountability in monitoring compliance (by both parties) of the agreement. As the Rani Jamara Kulariya Irrigation Scheme is inherently a farmer-managed and operated irrigation scheme, it is important for government to empower as much as possible the users and their WUAs and keep them in charge with minimum outside interference.

26. *Meaningful community participation requires substantial capacity building.* A separate project component has been designed to support the necessary capacity building of the WUAs to turn them into financially and technically sustainable organizations and to encourage inclusion of ethnic minority groups and women.

27. *Coordination between partner organizations is important to maximize project benefits.* In order to produce greater synergy and impact it is important to ensure coordinated program planning and implementation, particularly between the main implementing partners of DoI and DoA. In order to achieve this, a senior agriculture officer will be seconded to DoI's Project Implementation Office (PIO) in Tikapur and all the components will be managed from the field. Effort will be made to coordinate with similar projects such as IWRMP and PACT and other government and private institutions to benefit from their experiences, particularly in areas of community seed multiplication, agricultural inputs supply, value chain studies and farmer trainings.

28. *Integrating agriculture and irrigation increase benefits.* While it is important to improve the irrigation systems, considering that irrigation is only one input into agriculture it is equally important for extension agents and other agricultural specialists to work closely with farmers to develop appropriate cropping patterns and identify high value crops that provide better returns. The project has a component that starts addressing such agricultural support.

## **9. Safeguard Policies (including public consultation)**

29. The safeguard policies that are triggered: Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04); Indigenous Peoples (OP/BP 4.10); Involuntary Resettlement (OP/BP 4.12); Forests (OP/BP 4.36); Projects on International Waterways (OP/BP 7.50).

## **10. List of Factual Technical Documents**

Project Concept Note; Environmental Assessment; Social Assessment; Hydrological Studies; Various technical reports.

## **11. Contact point**

Contact: Joop Stoutjesdijk  
Title: Lead Irrigation Engineer  
Tel: (202) 473-3754  
Fax: (202) 614-0583  
Email: [Jstoutjesdijk@worldbank.org](mailto:Jstoutjesdijk@worldbank.org)

12. For more information contact:

The InfoShop  
The World Bank  
1818 H Street, NW  
Washington, D.C. 20433  
Telephone: (202) 458-4500  
Fax: (202) 522-1500  
Email: [pic@worldbank.org](mailto:pic@worldbank.org)

Web: <http://www.worldbank.org/infoshop>