

ASIAN DEVELOPMENT BANK

RRP: NEP 33209

**REPORT AND RECOMMENDATION
OF THE
PRESIDENT
TO THE
BOARD OF DIRECTORS
ON A
PROPOSED LOAN
TO THE
KINGDOM OF NEPAL
FOR THE
COMMUNITY-MANAGED IRRIGATED AGRICULTURE SECTOR PROJECT**

October 2004

CURRENCY EQUIVALENTS

(as of 15 October 2004)

| | | |
|---------------|---|----------------------------|
| Currency Unit | – | Nepalese rupee/s (NRe/NRs) |
| NRs1.00 | = | \$0.01389 |
| \$1.00 | = | NRs72.00 |

ABBREVIATIONS

| | | |
|----------|---|--|
| ADB | – | Asian Development Bank |
| APP | – | Agriculture Perspective Plan |
| ASPR | – | Agriculture Sector Performance Review |
| CPMO | – | central project management office |
| CO | – | community organizer |
| CSP | – | country strategy and program |
| DADO | – | district agriculture development office |
| DIAP | – | Decentralization Implementation Action Plan |
| DDC | – | district development committee |
| DG | – | director general |
| DOA | – | Department of Agriculture |
| DOI | – | Department of Irrigation |
| DOLIDAR | – | Department of Local Infrastructure Development and Agriculture Roads |
| DTO | – | District Technical Office |
| EIRR | – | economic internal rate of return |
| FMIS | – | Farmer -managed irrigation system |
| GDP | – | gross domestic product |
| HDI | – | Human development index |
| IDD/IDSD | – | Irrigation Development Division/ Irrigation Development Subdivision |
| IEE | – | initial environmental examination |
| ISPM | – | institutional strengthening and project management |
| IWRM | – | integrated water resources management |
| LGI | – | local governance institution |
| LSGA | – | Local Self-Governance Act |
| M&E | – | monitoring and evaluation |
| MFI | – | microfinance institution |
| MOAC | – | Ministry of Agriculture and Cooperatives |
| MOWR | – | Ministry of Water Resources |
| MTR | – | midterm review |
| NARC | – | Nepal Agriculture Research Council |
| NFIWUAN | – | National Federation of Irrigation Water Users Associations, Nepal |
| NGO | – | nongovernment organization |
| NPV | – | net present value |
| NRB | – | Nepal Rastra Bank |
| NVC | – | National Vigilance Center |
| NWP | – | National Water Plan |
| NWRS | – | National Water Resources Strategy |
| 9 FYP | – | ninth five-year plan |
| O&M | – | operation and maintenance |
| PAC | – | project appraisal committee |

| | | |
|------|---|--|
| PIR | – | poverty impact ratio |
| PPTA | – | project preparatory technical assistance |
| PRSP | – | poverty reduction strategy paper |
| PSC | – | project steering committee |
| RDA | – | Regional Directorate of Agriculture |
| RF | – | resettlement framework |
| RID | – | Regional Irrigation Directorate |
| RP | – | resettlement plan |
| RPSU | – | regional project support unit |
| SDR | – | special drawing rights |
| SIP | – | subproject implementation plan |
| SISP | – | Second Irrigation Sector Project |
| SMU | – | subproject management unit |
| SOE | – | statement of expenditure |
| TL | – | team leader |
| WECS | – | Water and Energy Commission Secretariat |
| WUA | – | water user association |

NOTES

- (i) The fiscal year (FY) of the Government ends on 15 July. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2004 ends on 15 July 2004.
- (ii) In this report, "\$" refers to US dollars.

This report was prepared by a team comprising K. Yokoyama (team leader), G. Atay, L. Chazee, A. Djusupbekova, G. Gewali, P. Logan, G. Rambaldi, N. Sapkota, A. Shrestha, and A. Tayyab.

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- C. Detailed Project Cost Estimates and Financing Plan
- D. Subproject Implementation Procedures and Arrangements
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- H. Resettlement Framework
- I. Sample Resettlement Plan
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- K. Initial Environmental Examination
- L. Environmental Assessment Procedures and Arrangements

LOAN AND PROJECT SUMMARY

| | |
|-------------------------------|--|
| Borrower | The Kingdom of Nepal |
| Classification | Targeting classification: Targeted intervention Sector: Agriculture and natural resources Subsector: Irrigation and drainage Themes: Sustainable economic growth, Governance, and Gender and development Subthemes: Developing rural areas, Public governance, and Gender equity in empowerment and rights |
| Environment Assessment | Category B: An initial environmental examination was undertaken, and the summary is in a core appendix. |
| Project Description | <p>The Project will enhance the livelihood of rural smallholders by improving the performance of the existing farmer-managed irrigation systems (FMIS) suffering low productivity and poverty in the Central and Eastern Development regions of Nepal, while establishing sound service delivery mechanisms and community institutions to support this end. The improved FMIS will intensify agricultural production in 25,500 hectares (ha) of existing irrigated area, bring an additional 8,500 ha under irrigation through improved water distribution, and thus benefit over 270,000 poor men and women. Implementation will take a participatory and process approach, following the initiatives of local water user associations (WUAs) with a proven track record of having constructed FMIS and doing self-sustained operation and maintenance (O&M). The process will be managed based on the performance of the concerned organizations in achieving the specified development targets. Institutional development support will aim at the effective operation of the improved participatory irrigation service delivery mechanisms to support inclusive development with due empowerment and livelihood enhancement of the poor including ethnic minorities and occupational castes (<i>dalit</i>), and sufficient integration with agriculture marketing opportunities and support services, while promoting sector-wide policy and institutional reforms toward sound governance.</p> |
| Rationale | <p>In Nepal, irrigation is an essential input to improve agriculture productivity, which remains the lowest among the neighboring countries. The 20-year Agriculture Perspective Plan (APP) that was launched in 1995 with Asian Development Bank (ADB) assistance has prioritized irrigation as the foundation of a modern production system, with emphasis on improving the performance of traditional surface water FMIS, which account for 55% of the total irrigated area and 23% of net cultivated area of 2.6 million ha. Many FMIS suffer from low productivity that is barely above subsistence level, due to unreliable diversion and high distribution loss and maintenance costs caused by fragile and rudimentary intake and distribution structures. FMIS offer good scope for</p> |

enhancing productivity, expanding the command area at relatively low cost, and short lead time, and building on the existing WUA capacities through a participatory approach.

ADB has assisted in improving FMIS since 1987 including the recently completed Second Irrigation Sector Project. While project performance has been positive, with many FMIS yielding reasonable economic benefits to smallholders, there is still scope for improvement in delivering maximum benefits particularly to the poor in the community, and enhancing WUA capacity to become more active agents that can drive dynamic agriculture development within the locality. There is need to further improve the project design by ensuring sufficient attention, time, and resources for nonstructural activities such as empowering WUAs and supporting agriculture and livelihood enhancement, and sound governance of public sector institutions for monitoring and quality control. Essential changes in the management system and behavior of public institutions to become genuine service-oriented facilitators are also called for.

Improving FMIS productivity is still a priority in the agriculture sector, with 0.3 million ha currently requiring urgent rehabilitation. However, a new approach is needed following the Government's 2002 Poverty Reduction Strategy Paper (PRSP) that committed itself to (i) reorientation of APP to strengthen its integrated and coordinated market-oriented approach, its pro-poor focus with targeting, and support for decentralization; and (ii) reforms of sector institutions for sound governance. There is a pressing need to operate the improved service delivery mechanisms for FMIS renovation that fully address these new sector needs and the lessons of previous assistance, while pursuing policy and institutional reforms that provide a sound basis for their operation. The Project is designed to address these challenges and is needed to renovate the remaining subsistence FMIS to attain their maximum sustainable benefits, particularly those for the poor and the disadvantaged, with sound sector governance. The sector loan modality is adopted in view of the Government's sound policy and plan framework in the sector such as APP, PRSP, and the 2003 Irrigation Policy; and its progressively improving capacity to support FMIS renovation, building on the existing WUAs.

Objective

The Project aims to improve agriculture productivity and sustainability of existing FMIS suffering from low productivity and high incidence of poverty, thereby enhancing the livelihood of poor men and women in rural Nepal. For this purpose, the Project will (i) provide improved means for beneficiary participation and empowerment, irrigation and associated infrastructure, agriculture and targeted livelihood enhancement for the poor, and sustainable O&M by WUAs; and (ii) strengthen policies, plans, and institutions for more responsive service delivery and sustained growth and poverty reduction impacts.

Cost Estimates The estimated project cost is \$38.6 million equivalent, comprising foreign exchange of \$12.8 million and local currency equivalent of \$25.8 million, including taxes and duties of \$5.5 million equivalent.

Financing Plan (\$ million)

| Source | Foreign Exchange | Local Currency | Total Cost | Percent |
|---------------|------------------|----------------|-------------|------------|
| ADB | 8.4 | 11.6 | 20.0 | 52 |
| OPEC Fund | 4.1 | 2.9 | 7.0 | 18 |
| Government | 0.3 | 9.1 | 9.4 | 24 |
| Beneficiaries | 0.0 | 2.2 | 2.2 | 6 |
| Total | 12.8 | 25.8 | 38.6 | 100 |

ADB = Asian Development Bank, OPEC Fund = Organization of Petroleum Exporting Countries Fund for International Development.

Source: ADB estimates.

Loan Amount and Terms The equivalent in various currencies of SDR13.615 million (\$20.0 million approximately) from the Special Funds resources of ADB. The terms are 32 years including a grace period of 8 years, and an interest charge of 1.0% per annum during the grace period and 1.5% per annum thereafter.

Period of Utilization Until 30 September 2012

Estimated Project Completion Date 31 March 2012

Executing Agency Ministry of Water Resources

Implementation Arrangements Project implementation aims to institutionalize improved service delivery mechanisms for FMIS including irrigation and agriculture extension services within the regular setup in Department of Irrigation (DOI) and collaborating agencies, e.g., Department of Agriculture (DOA) and local governance institutions (LGIs). A central project management office (CPMO) for overall project management and technical backstopping will be set up in DOI with staff assigned from DOI and collaborating agencies. Day-to-day implementation is delegated to the district-level multidisciplinary subproject management unit (SMU) set up with staff representing DOI, DOA, and LGIs, under the supervision of a regional project support unit (RPSU) established in each development region. WUAs will have a major role in the process by monitoring and endorsing outputs such as the subproject plan, design, and quality and quantity of services provided. Regular SMU-WUA review meetings will be organized as major decision-making forums.

In addition, the National Vigilance Center under the Office of Prime Minister and Council of Ministers will undertake external technical audit for selected subprojects using the loan proceeds.

Procurement

Goods and services financed by the ADB loan will be procured in accordance with ADB's *Guidelines for Procurement*. Equipment packages valued at \$500,000 equivalent or less will be procured following international shopping procedures. Civil works under the Project will comprise many small contract packages for improving irrigation facilities in scattered locations, and will be contracted through local competitive bidding procedures acceptable to ADB.

Consulting Services

A team of consultants to be recruited from a firm will support institutional strengthening and project management by providing 574 person-months of consulting services (55 international and 519 domestic) for irrigation management, participatory development, water resources planning and design, minor irrigation, agriculture development planning, agriculture extension, agriculture economics, gender and poverty, resettlement, environmental management, and financial management and accounting. Consultants and nongovernment organizations (NGOs) will be recruited using quality and cost-based selection procedures in accordance with ADB's *Guidelines on the Use of Consultants*.

Project Benefits and Beneficiaries

At full development, the Project will improve the livelihood of over 270,000 poor men and women by renovating about 210 FMIS covering 34,000 ha. The main benefits are increased agriculture production brought about by more reliable irrigation, increased labor opportunities, improved nutritional status particularly among smallholders suffering from chronic food deficit, and increased incomes and reduced poverty in subproject areas. The 210 WUAs will have enhanced capacity to sustain improved irrigation water management and better cropping practices. The economic internal rate of return of three sample subprojects is 23–25%, due largely to incremental production of food grains followed by commercial crops to tap the available marketing opportunities and build on the existing cropping pattern. At the national and local levels, the Project will improve service delivery systems to attain maximum benefits and sustainability through irrigation interventions with sound quality control, along with improved sector governance through sector-wide policy and institutional reforms.

Surveys conducted during project preparation estimated that 54–62% of beneficiary households in the three core subproject areas fall below the poverty line, which is higher than the national average of 39%. The estimated poverty impact ratio for these subprojects is 39%–51%. The social development strategy will focus on prioritizing subproject selection in areas of high poverty incidence with an ethnic minority population, enhancing WUA capacity to support a socially inclusive approach of participatory development, empowering the poor and the disadvantaged such as dalit through targeted support, enhancing the role of women in project institutions and programs, and policy and institutional

reforms to improve governance while equalizing opportunities and access to irrigation among the poor men and women, and disadvantaged people in the tail end.

Risks and Assumptions

The Project has several types of risk that could adversely affect its effective implementation and sustained benefits. In particular, the ongoing insurgency poses a considerable risk.

The Project allows flexible site selection to renovate FMIS owned by rural communities, using a demand-driven, participatory, and transparent approach, that has proven effective in similar types of rural infrastructure works under insurgency. The Project is thus deemed implementable under conflict situations, with due incorporation of coping measures such as careful security monitoring, staff training to work with insurgency, mobilization of strong community support to build local trust in the project staff, and a flexible implementation modality for delivering more services through local NGOs and consultants less prone to conflict situations. The Project will start with operating in areas with relatively securer environment, and progressively expand coverage by establishing models that can operate in more conflict-affected conditions. At present, the level of conflicts in Central and Eastern Development regions covered under the Project is generally less severe than that in the other regions, particularly in the terai districts.

Other possible risks are (i) WUA sustainability, (ii) interagency coordination and governance, and (iii) implementation delay. To mitigate the first risk, the Project will discern and develop genuine WUA interest, ownership, and capacity through identification survey, facilitation support, and training while achieving specified institutional targets prior to construction. The governance-related risks will be addressed by strengthening management, monitoring and quality control systems of the concerned institutions to ensure participation, transparency, and accountability in implementation. The risk of implementation delay will be mitigated by identifying WUAs with genuine interest and member support during screening, and having a larger number of subproject at the pre-construction stage compared with the annual construction targets.

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on (i) a proposed loan to the Kingdom of Nepal for the Community-Managed Irrigated Agriculture Sector Project, and (ii) proposed administration by the Asian Development Bank (ADB) of a loan to be provided by the OPEC Fund for International Development (OPEC Fund) for the Project.¹ The project framework is in Appendix 1.

II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS, AND OPPORTUNITIES

A. Performance Indicators and Analysis

2. **Sector Description.** Nepal is one of the poorest countries in Asia: in 2002 per capita income was \$241, 39% of the population lived in poverty, and 48% of children under 5 years were chronically malnourished. Over 90% of the poor live in rural areas, and poverty is more concentrated among smallholders and landless people, and among ethnic minorities and dalit (occupational castes at the lowest stratum of Hindu social hierarchy).² Ethnic minorities and dalit represent 36% and 13% of the population, respectively. Agriculture contributes 39% of the gross domestic product (GDP) but it plays a central role in the livelihood of the poor, providing employment for over 80% of the active workforce and meeting their nutritional needs.³ Yet productivity remains low and largely subsistence oriented. As to food grains that account for some 85% of the cultivated land, the yields of paddy, maize, and wheat remain at 2.7 tons/hectare (t/ha), 1.8 t/ha, and 1.9 t/ha, respectively, the lowest among the neighboring countries. Key constraints are (i) difficult terrain conditions vulnerable to natural calamities such as floods and landslides; (ii) poor physical capital base such as irrigation and rural roads; (iii) limited access to inputs, output markets, and financial services; (iv) low technology base and weak extension; and (v) insufficient governance of public institutions to deliver development services to a socially diverse population particularly those who are disadvantaged.

3. Since 1995, sector development efforts have been driven by the 20-year Agriculture Perspective Plan (APP) that was prepared with ADB assistance and formed the basis of the 9th 5-year plan (9FYP: FY1998–FY2002). The APP aimed at achieving over 4% annual growth rate for food grains and higher rates for cash products by improving total factor productivity through (i) liberalization of input and output markets for greater private sector involvement; and (ii) prioritized public investments for improved provision of irrigation, seeds, fertilizer, finance, roads, and extension. ADB also played a key role by promoting reforms⁴ and providing lead external finance (Appendix 2). According to a recent agriculture sector performance review (ASPR),⁵ sector growth rate accelerated to 3.3% during the 9FYP period, with higher rates recorded for cash crops and livestock. Yet overall performance is still short of targets and is now affected by the insurgency. The country remains a net importer, albeit small, for food grains. There has been little change in the production mix, with the shares of food grains (34%), other

¹ Project preparatory technical assistance was provided under ADB. 2001. *Technical Assistance to the Kingdom of Nepal for Preparing the Community-Managed Irrigation (Central and Eastern Basins) Sector Project*. Manila. The chronology of project development is in Supplementary Appendix A.

² Over 70% of landholdings have less than 1 hectare (ha) of land. While most rural households have some land in the hills, up to 40% of the rural population are landless in the terai, including the majority of dalit. There are also large areas where poverty incidence is high among the larger farmers due to low land productivity.

³ Livelihoods of the poor are varied and complex, with increasing nonfarm incomes in recent years including those from out-migration. Yet there is evidence of a high increase in labor demand and incomes in areas of high agriculture growth. Daily wage labor from agriculture is also a key source of income for poor women.

⁴ Including (i) deregulating fertilizer trading and pricing, (ii) eliminating subsidies and import duties for shallow-tubewells, (iii) privatizing Agriculture Inputs Corporation, and (iv) rationalizing public sector role in food distribution.

⁵ ADB. 2000. *Technical Assistance to the Kingdom of Nepal for Agriculture Sector Performance Review*. Manila.

crops (27%), and livestock (29%) in agriculture GDP largely unchanged, despite opportunities for producing high-value products for domestic and Indian markets in areas with good irrigation and road access. Thus, intensifying food grain production, and diversifying and commercializing agriculture remain key challenges.

4. **Irrigation.** Due to the highly erratic rainfall pattern in Nepal, irrigation is an essential input for intensifying agriculture across the year.⁶ Of a total cultivated land of 2.64 million ha, about 1.13 million ha (43%) has access to irrigation: (i) 0.62 million ha of farmer-managed irrigation systems (FMIS) using surface water, traditionally constructed and maintained by farmers; (ii) 0.27 million ha developed by the Department of Irrigation (DOI) using surface water; and (iii) 0.24 million ha of groundwater irrigation in the alluvial terai, a fertile plain in southern Nepal. However, the productivity of these areas is low. The actual irrigated area against the developed potential in the monsoon, winter, and spring remains at 70%, 20%, and 10%, respectively.⁷ DOI-developed systems are even less utilized due to lack of user participation and poor operation and maintenance (O&M). Many FMIS suffer from low yields due to fragile diversion structures (made of earth, logs, or brushwood and frequently washed away by floods) and rudimentary distribution systems causing unreliable water supply, and high distribution loss and O&M costs. At present, urgent rehabilitation is required for over 0.3 million ha of FMIS.

B. Analysis of Key Problems and Opportunities

5. **Agriculture Support Services.** Following the APP's market-oriented reforms, the private sector has shown dynamic response in marketing farm inputs and outputs. However, the process is still at a formative stage. Fertilizer use by farmers has increased by nearly 20% per annum in recent years after deregulation of private distribution. Yet its applied rate is far less than half the levels suggested by the Department of Agriculture (DOA). Availability and use of improved seeds also remain a major constraint particularly for food grains, for which few private agents exist to supplement the meager public seed supply.⁸ Mainly due to expansion of microfinance institutions (MFIs), the number of borrowers in rural finance increased nearly threefold in the 1990s to reach 22% of households. Yet the MFIs' geographical outreach is still limited. In output marketing, successful cases of sales chains for high-value crops are emerging albeit only sporadically, linking farmers and wholesale markets. As to extension, while DOA staff have technical know-how in modern cropping practices, field-level dissemination is constrained by lack of resources and a weak mechanisms for beneficiary participation. On the other hand, there are private providers including nongovernment organizations (NGOs) delivering effective extension services on a contract basis. Overall, these conditions call for strategic provision of critical public services, concerted efforts in facilitating the delivery of key inputs and support services, and careful assessment of the postharvesting marketing opportunities. Farmer capacities also need strengthening so that they can collectively drive this process.

6. **Irrigation Efforts to Date.** Historically irrigation has received high priority in public investments. Initial efforts were directed toward developing new and complex large-scale schemes, which suffered from poor performance due to lack of local institutions to support effective O&M. Starting in the late 1980s, the Government shifted its focus to participatory improvement of existing irrigation systems. FMIS renovation was identified as a very attractive opportunity in view of the existence of farmer water user associations (WUAs) with a proven

⁶ In a field survey in the ASPR, 51% of farmers cited lack of reliable irrigation as a major constraint in increasing production, followed by availability of improved seeds and fertilizer (11%), and lack of extension (9%).

⁷ About 40% of the irrigated land has access to year-round irrigation. Water is not available in many schemes in southern terai, which have small catchment, in particular during spring (March–May).

⁸ In the case of wheat, improved seed supply currently meets less than 20% of the amount required at the national level to achieve the replacement rate recommended by DOA. The rates for other food grains are lower.

track record of self-sustained O&M. Mostly small and medium in size,⁹ FMIS have good scope for enhancing productivity and expanding the command area by resolving the aforementioned technical deficiencies with relatively low cost and short lead time. DOI in 1992 prepared the Irrigation Policy that set out guidelines for participatory irrigation development, and improved it in 1997 following the lessons of earlier investments. DOI's institutional structure was also improved, with the establishment of an irrigation management section in its central and field offices and deployment of social scientists; however, strengthening the nonengineering capacities of DOI is still a future goal. ADB played a key role during this process of policy, plan, and DOI strengthening through assistance to three FMIS projects launched in 1987–1991.¹⁰

7. Building on these developments, the APP further prioritized irrigation, after which ADB assisted the Second Irrigation Sector Project (SISP)¹¹ to improve FMIS in two eastern regions. ADB is also supporting groundwater irrigation development in the terai areas of the same regions. The World Bank has funded a similar package covering three western regions, along with broad water sector institutional reforms, whereas the European Commission has supported FMIS renovation in selected districts in the Western Development Region (Appendix 2).

8. **Lessons from FMIS Interventions.** ADB-assisted FMIS projects have been rated successful in postevaluation reports.¹² Most WUAs were capable of increasing the command area, crop intensity, and yields, and the returns were deemed sufficient to justify investments. However, there are still notable gaps between what is realized and the potential attainable in progressive farming practices. Access to extension and other inputs is often a constraint. WUAs are largely confined to routine irrigation O&M, despite their interest and potential to become useful organizations to drive the local agriculture development process. Overall, the lessons call for significant improvement in project design and further capacity development. Specifically, interventions should be driven by the aim of improving water use and agricultural production as opposed to constructing structures, a still lasting interest in DOI. Second, strategic site selection is needed to tap existing postharvest marketing and poverty reduction opportunities and build on coherent WUA willingness, along with careful planning, to facilitate the delivery of extension, inputs, and credit. Third, sufficient resources should be provided for nonstructural works including agriculture programs and WUA strengthening as capable community agents with collective bargaining power to liaise with necessary agriculture service providers. Fourth, improving overall quality control and monitoring is essential to ensure participatory processes at all stages. Such processes call for generic changes in the management and behavior of public institutions, from being conventional implementers to becoming service-oriented facilitators.

9. In terms of poverty implications, positive impacts—direct (via crop intensification) and indirect—have been observed in the livelihood of small and marginal farmers and landless people, even in the localities of ethnic minorities. The latter notably (i) had wage labor opportunities; (ii) increased livestock production (via higher fodder availability), and (iii) rented lands from larger farmers (who had labor shortages).¹³ Marginal non-irrigated areas benefited significantly through an expanded command area. However, past projects did not have

⁹ In Nepal, small schemes are defined as those having command areas of less than 25 ha in the hills and 200 ha in the terai, while medium schemes have less than 500 ha in the hills and 2,000 ha in the terai.

¹⁰ Including the East Rapti Irrigation Project (ERIP), approved in 1987; the Irrigation Sector Project, approved in 1988; and the Rajapur Irrigation Project, approved in 1991.

¹¹ ADB. 1996. *Report and Recommendation of the President to the Kingdom of Nepal for the Second Irrigation Sector Project*. Manila (for \$25 million, approved on 16 May 1996, and completed in June 2003).

¹² Project completion reports of the three projects in footnote 10 and project performance evaluation report of ERIP.

¹³ A survey in the selected SISP subprojects noted that on average, the income of marginal farmers (with less than 0.5 ha land) increased from 40% below the poverty line before the project to 15% above after the project. Larger farmers also preferred to lease their land to this group who had more manure to apply per unit of farmland.

mechanisms to empower the disadvantaged groups and deliver specific services to them. There is a need to strengthen the commitment and capacities of sector institutions to address poverty agendas within FMIS projects. Appendix 3 gives the lessons learned.

10. **Recent Government Initiatives.** In 2002, the Government adopted the Poverty Reduction Strategy Paper (PRSP) and the 10FYP (2003–2007), and renewed commitments for rural-oriented poverty reduction. In agriculture, the PRSP aims to enhance APP implementation with improved service provision and governance, through stronger agency coordination, private sector and NGO engagement, community participation, and decentralization, in line with the ASPR recommendations. Progressive steps were also taken following the 1999 Local Self-Governance Act (LSGA) and the 2002 Decentralization Implementation Action Plan (DIAP), based on which district offices of DOA were placed under the district development committees (DDCs).¹⁴ As to irrigation, the Government committed itself to further policy and institutional reforms in line with the ongoing water sector reforms, including the 2002 National Water Resources Strategy (NWRS). The NWRS set out sector goals and short- to long-term institutional and physical targets, adopting the principles of integrated water resources management (IWRM) and participatory service delivery. The Government is now preparing the IWRM policy and a 25-year national water plan (NWP) while defining an institutional framework for IWRM at national and river basin levels.¹⁵ Reforms of sector institutions such as DOI are also envisaged in line with this process. Overall, however, support is needed to transform these initiatives into sound sector operations.

11. **ADB's Strategy.** ADB's new country strategy and program (CSP) for Nepal was prepared in 2004 following the PRSP and ASPR. The CSP prioritizes investments in rural areas that generate quick benefits and support the inclusive process of development. In view of large FMIS areas still suffering from low productivity and poverty, and of the scope for promoting minor irrigation that targets the poor in nonirrigated areas, the CSP recognized that community-based irrigation is one of the strategic pillars for supporting rural development, along with rural infrastructure, crop diversification and commercialization, and livestock development. As to FMIS, a pressing need now is to define and operate improved delivery mechanisms for their renovation, incorporating the lessons and addressing the new challenges identified in PRSP, ASPR, and NWRS. This objective should be pursued with necessary policy and institutional reforms that provide a sound basis for their operation. Addressing these tasks is consistent with ADB's water policy, and will contribute to attaining maximum benefits from FMIS renovation with further empowered WUAs, and improved governance of public sector institutions.

12. **Policy Dialogues and Sector Opportunities.** The Project was prepared to address the challenges with necessary policy dialogues. Specifically, the project preparatory technical assistance (PPTA, footnote 1) contributed to the drafting of the new irrigation policy, which effectively incorporated the emerging principles and lessons including river basin-based planning, WUA empowerment with pro-poor and gender focus, and DDC capacity development to support devolution, to be institutionalized under the Project. Second, with an overall vision to become a genuine service-oriented facilitator to support beneficiaries, DOI agreed to proceed with due institutional reforms, with specific agendas including (i) setting out an institutional development strategy, (ii) preparing and carrying out action plans for improving human and financial resources management, (iii) strengthening internal quality control, and (iv) defining and taking steps to devolve FMIS operations following the LSGA. Third, as a concrete step to improve quality control and governance, the Government decided to establish a technical audit

¹⁴ LSGA also envisages devolution of small-scale FMIS development support from DOI to DDC. The contribution of the proposed Project to this direction is described in [para. 38](#).

¹⁵ These are assisted by the World Bank and the Canadian International Development Agency (CIDA).

division in the National Vigilance Center (NVC) under the Office of the Prime Minister and Council of Ministers, and to start operating technical auditing in the irrigation and rural infrastructure sectors, with ADB assistance.¹⁶ Fourth, the Government agreed to consult with ADB on continued reforms in the agriculture and water resources sector, including the preparation of the IWRM policy, its institutional framework, and the NWP. The Project has also strengthened mechanisms for more effective FMIS renovation by incorporating the preceding lessons for enhancing agriculture growth and poverty reduction impacts and WUA empowerment, through strategic site selection that prioritizes poverty pockets and confirms marketing outlets, sufficient resources for nonengineering activities with clear output targets, outsourcing to private providers, and improved internal and external quality control. The sector institutional analysis is in Appendix 4 and Appendix 5 gives the policy and institutional reforms and implementation matrix. (Sector analysis is in Supplementary Appendix B.)

13. **Sector Approach.** The Project has been formulated following ADB's sector loan modality, based on (i) the Government's APP, NWRS, and the 2003 Irrigation Policy that form a sound policy framework to promote participatory FMIS improvement; (ii) the existing long-term investment plan, which is embodied in the 10FYP following the APP, and is now being refined as NWP while incorporating the investment schedule of the Project; and (iii) progressively developing the sector institutions' capacity to enhance the productivity of FMIS, building on the existing WUAs that will be further strengthened during the Project.

III. THE PROPOSED PROJECT

A. Objective

14. The overall goal of the Project is to promote inclusive economic growth while reducing poverty in the rural areas of Central and Eastern Development regions.¹⁷ Its specific objective is to improve agriculture productivity and sustainability of existing small and medium-size FMIS suffering from low productivity and high poverty incidence, and thus enhance the livelihood of poor men and women including ethnic minorities and dalit. To achieve the objective, the Project will (i) provide improved means for WUA empowerment, irrigation facilities, agriculture extension, and targeted livelihood enhancement to build the human capital of the poor including women and traditionally neglected disadvantaged groups; and (ii) strengthen policies, plans, and institutions for more responsive service delivery and sustained impacts.

B. Components and Outputs

15. The Project has two components: (i) participatory irrigated agriculture development for FMIS, and (ii) institutional strengthening and project management (ISPM). The output of the first component is substantially improved agricultural productivity and reduced poverty in over 34,000 ha of land (about 210 FMIS) including 8,500 ha of expanded command area,¹⁸ and improved livelihood for over 270,000 poor men and women. The second component will culminate in operation of mechanisms for improved service delivery to develop productive and sustainable FMIS through (i) further improved irrigation policies, regulations, and plans; (ii) strengthened DOI (in terms of human resources and management capacity), DOA, local governance institutions (LGIs), and WUAs; and (iii) enhanced institutional linkages to deliver services in coordination with NGOs and the private sector.

¹⁶ ADB. 2003. *Technical Assistance to the Kingdom of Nepal for Strengthening Project Implementation and Quality Assurance*. Manila.

¹⁷ Poverty incidence is lower in the Central and Eastern Development regions due to higher urbanization, but tracts of concentrated poverty are widely found in their rural areas in particular those with low agriculture productivity.

¹⁸ Overall, the Project will cover 22,000 ha of FMIS in the terai and 12,000 ha in the hills and the mountains.

1. Participatory Irrigated Agriculture Development for FMIS

16. This component will support participatory development of FMIS subprojects through a process approach. It has four subcomponents: (i) participatory planning and beneficiary mobilization, (ii) community-based irrigation and associated infrastructure, (iii) agriculture development and livelihood enhancement, and (iv) support for sustainable O&M. To ensure effective process management, each subproject will have distinct output targets at each stage of the implementation cycle, which are set as benchmarks for the next stage. The number of subprojects in each district will be managed following the performance of the district-level institutions.

a. Participatory Planning and Beneficiary Mobilization

17. **Participatory Subproject Identification and Planning.** The Project will support identification of viable subprojects and participatory preparation of comprehensive subproject implementation plans (SIPs). Activities include (i) formulation of district irrigated agriculture development strategies, (ii) information campaign, (iii) subproject screening, and (iv) SIP preparation with feasibility studies. At the outset, the Project will prepare an irrigated agriculture development strategy for each district that maps out marketing opportunities, water availability, and poverty conditions. The Project will also organize information campaigns through DDCs, to which interested WUAs will submit requests that are then screened in light of the district strategy, field assessments, and consultation with farmers including downstream users. Those in areas of high poverty incidence, high proportion of ethnic minority and dalit population, long-term self-sustaining O&M records, and high marketing potentials will be prioritized. Finally, a multidisciplinary feasibility study will be carried out for the selected subprojects to prepare a comprehensive SIP, which will stipulate specific actions, programs, and input and output targets for WUA strengthening, irrigation infrastructure, agricultural development, and livelihood enhancement for the poor and disadvantaged groups.

18. **Mobilization of Water User Association Beneficiaries.** The Project will empower WUAs to manage activities at the preconstruction, construction, and postconstruction stages. WUAs will play effective organizational, operational, resource mobilization, and networking functions to facilitate input delivery and output marketing with a collective bargaining power. The Project will initially help WUAs participate in preparing and endorsing the draft SIP. Then, the Project will support the WUAs to implement the institutional strengthening plan they developed and included in the SIP, including (i) enrolling members and mobilizing functional men and women groups, (ii) registering, with the formation of executive committees and operational rules, and (iii) implementing routine O&M and minor improvement works. The Project will facilitate the process by recruiting community organizers (COs) locally. NGOs will be engaged to train COs.¹⁹ At least 33% women participants are targeted for all activities, and ethnic minority and dalit will be represented in proportion to their number among the subproject beneficiaries.

b. Irrigation and Associated Infrastructure

19. After a WUA achieves the institutional development targets, the Project will support the participatory detailed design and construction of infrastructure such as diversion structures, cross-drainage works, improved and extended canal systems, and flood protection facilities to be operated by the WUA. The detailed design will be prepared in consultation with the WUA and endorsed by it before finalization. Existing design standards will be revised to promote low-cost

¹⁹ The Project will also engage the National Federation of Irrigation Water User Associations Nepal (NFIWUAN) and its chapter organizations in districts where they have sufficient resource base.

and simple structures following domestic and international experience. The WUA will then provide beneficiary contribution, mostly in the form of labor. During the process, the Project will support preparation and implementation of the resettlement plans. Completion of these activities will serve as a benchmark to initiate the procurement process to implement civil works.

20. Local contractors will be engaged to construct key structures, while simpler structures and earthwork will be implemented by WUAs with the support of DOI technicians. For intensive construction supervision, supervisors will be fielded on a full-time basis. The WUA will also be trained and engaged in monitoring and final confirmation of civil works done by contractors. Internal and external technical audit will be arranged to monitor full compliance with the contract and support construction quality management.

c. Agriculture Development Support and Livelihood Enhancement

21. This subcomponent will focus on improving farmer skills in crop productivity through self-sustaining and self-reliant farmer groups, and developing WUA capacities to support this end. Its outputs will be monitored against the SIP targets for production, improved market access for agricultural produce, and incomes at subproject level.²⁰ Agriculture development will take into account the comparative labor productivity and the risk dimensions, main factors in farmer decisions in agricultural investment. The activities will include the following, and the WUA will monitor and confirm delivered services in light of the SIP specification.

22. **Agriculture Extension and Support.** The Project will support agricultural extension services in the subproject area to promote adoption of high-yielding and improved varieties of crops and their diversification. The support will be provided by designated Government agriculture extension and irrigation staff, and private sector or NGOs engaged. Activities will include (i) field demonstration and training through a farmer field school approach covering on-farm water management, integrated pest management, and cropping calendar management; (ii) farmer tour to most successful FMIS; (iii) training workshops; and (iv) practical research done by Nepal Agriculture and Research Council (NARC). As part of the field demonstration, the Project will also support seed multiplication by delivering foundation seeds and technical support. WUAs will sustain extension activities by operating the cost recovery norms for the demonstration inputs that will be repaid by the concerned farmers to the WUA as seed money, and establishing in-house extensionists within the WUA through training.²¹ WUAs' technical and managerial capacities will also be strengthened to facilitate improved farmer access to agriculture inputs and other services collectively to reach better deals with providers and enhance their accountability to clients.

23. **Livelihood Enhancement.** To enhance development impacts for the poor, the Project will provide support targeting vulnerable groups including women, the landless, and dalit, to assist their specified livelihood activities such as vegetable gardening. Where appropriate, it will also help establish linkage between these vulnerable WUA member groups and available microcredit resources such as the Rural Microfinance Development Center and its network of MFIs to promote group savings and deliver microcredit. Qualified MFIs will be engaged for this purpose. The Project will also support the delivery of technical services available at district level,

²⁰ This component will be complemented by the proposed Commercial Agriculture Development Project in the eastern regions, programmed in 2005. Specific synergy will be laid out in the SIP, along with the arrangements for delivering non-Project supported inputs and services such as fertilizer, pesticides, improved seeds, etc.

²¹ Extension will be provided through WUA field channel groups, with demonstration plots selected from among marginal farmers. From each group two members, a man and a woman, will be selected to be group leaders and will be trained to serve as local extensionists. Groups will have at least 35% women, following the policy of the Ministry of Agriculture and Cooperatives on women's representation and participation.

including training for income generation such as rice cum fish culture, crop processing, livestock raising, and cottage industries. Specific programs will be set out in the SIP with the poor groups while seeking synergy with ongoing development programs on microfinance, livestock, skills development, commercial agriculture, and rural livelihoods in the district, including those assisted by ADB and other sources.

24. **Minor Irrigation for the Poorest.** The Project will demonstrate innovative minor or micro irrigation systems, such as sprinkler and drip irrigation based on water harvesting, promoting collective efforts by the poorest people, particularly ethnic minorities and dalit. This activity will be implemented as action research. With the engagement of NGOs, the Project will support (i) assessment of available experience, (ii) design of appropriate types of intervention packages, (iii) identification of activity areas, (iv) preparation of a participatory plan including a feasibility study, and (v) pilot implementation through resource mobilization by groups.

d. Support for Sustainable O&M of FMIS

25. Selecting FMIS with long-term records of self-managed O&M (para. 17) is a proven way to ensure the sustainability of renovated FMIS in past projects, to which the pursuit of lower cost and simple structures (para. 19) will further contribute. On top of these, the Project will operate a monitoring and support system for sustainable subproject O&M and also for those completed in previous projects. For new subprojects, on-the-job training will be provided to prepare and implement O&M and resource mobilization plans for WUA. In addition to undertaking routine O&M, WUAs will establish and increase, as conditions for subproject selection and implementation, an emergency reserve fund to be used for nonrecurrent maintenance. For subprojects completed in previous projects, a database will be set up through stocktaking on their performance and impact indicators. Starting in the year 3, the Project will support the rehabilitation of a limited number of completed schemes that have been damaged by excessive natural disasters, following a separate appraisal procedure to be agreed upon with ADB. The share of ADB funding will be phased out each year toward project completion, after which the Government will provide a regular budget to support such subprojects.

2. Institutional Strengthening and Project Management

26. This component comprises (i) support for national-level institutional strengthening; (ii) project management, monitoring, and quality control for FMIS renovation; and (iii) training of project personnel and stakeholders. Consulting services will be provided for these purposes along with the necessary hardware and software.

a. Support for National-Level Institutional Strengthening

27. The Project will monitor and advise on the ongoing reforms in the agriculture and water resources sectors while supporting practical institutional actions to improve the delivery of FMIS operations. Activities monitored and supported are shown in the policy dialogue matrix (Appendix 5). For DOI, specific outputs will be improved sector governance measured by (i) further improved irrigation policy and FMIS investment plan following the project experience; (ii) an institutional development strategy with gender-responsive perspectives; (iii) improved staff capacity development programs and management rules; (iv) improved management systems including FMIS planning, design, implementation, quality control, and monitoring; and (v) progress in devolving irrigation operations to LGIs. While the activities to produce these outputs are implemented by the Government with formation of specific working groups, the Project will provide consulting services to support the processes.

b. FMIS Project Management, Monitoring, and Quality Control

28. The Project will operate participatory project management, monitoring, and quality control systems to ensure the subproject output quality. Activities will be managed through a central project management office (CPMO), regional project support units (RPSUs), and district-level subproject management units (SMUs). As measures for subproject-level participatory decision making and monitoring, the Project will support (i) regular SMU-WUA meetings to jointly review progress and make subproject decisions, (ii) fielding of mobile teams from RPSUs to verify key subproject outputs, and (iii) regular RPSU-SMU managerial review meetings. Consultancy inputs will be provided to assist the effective operation of the mechanisms through on-the-job training and learning. The performance of delivery mechanisms for FMIS renovation and other support services is also regularly monitored and evaluated against the set indicators, for continuous modification and improvement during the project implementation period.

29. The Project will also support external technical auditing of FMIS renovation assisted under the Project, which is undertaken by NVC in liaison with the separate technical assistance to establish and operate technical auditing in the rural infrastructure sector (footnote 16).

c. Training

30. The Project will provide training for institutional strengthening in various public and private institutions involved in the project activities, including training for operating staff as well as for institutions and trainers to impart relevant training activities.²² Such training will enhance skills for managing participatory, socially inclusive FMIS development; WUA mobilization; resettlement; environmental management; improved design and construction management; agriculture and social development; and quality control. The consultant team will improve the existing capacity development plans of DOI while addressing issues of gender inequality and enabling women to effectively articulate their needs, and will arrange for and supervise training.

C. Special Features

31. The Project has several features to enhance irrigated agriculture development and poverty reduction through policy and institutional reforms, and strengthening participatory service delivery with enhanced quality control mechanisms:

- (i) The Project will put into operation key principles of the 2002 NWRS and the 2003 Irrigation Policy, in particular participatory and sustainable irrigation effectively integrated with agriculture programs that have an enhanced pro-poor focus, and promote due representation of women and other vulnerable people in WUAs and delivery of targeted support to them. The Project will be implemented with specific institutional reform actions owned by DOI to fully implement those principles, by pursuing improvement in staff resources, skills, and management capacities.
- (ii) The Project will promote irrigated agriculture development by preparing district-level strategies and subproject-level comprehensive agriculture development plans to address local production and marketing constraints, to be implemented with monitorable targets. The Project will also establish self-sustaining extension mechanisms within WUAs by developing in-house extensionists, and applying cost recovery norms in extension programs to carry on generations of demonstrations.

²² For this purpose, the Project will support development of training programs provided through the designated institutions, e.g., concerned divisions of DOI and DOA, Nepal Staff College, and Nepal Engineering College.

- (iii) The Project will improve quality control mechanisms. Its internal quality control system will ensure that when subprojects are implemented, there will be progressive achievement of the predefined targets at each step, and in line with the absorptive capacity of the local institutions. The system's operation is further scrutinized through regular external technical auditing by NVC.
- (iv) The Project will empower WUAs to progressively take on implementation roles while transforming the line agency roles to facilitation and technical support. WUAs are entrusted to endorse key subproject decisions, monitor the delivered service quality, and implement the increasing number of civil works within their enhanced capacity. WUAs are further trained to facilitate farmer communication with service providers, to reach better deals collectively, and to improve provider accountability.

D. Cost Estimates

32. The total project cost is estimated at about \$38.6 million equivalent, of which \$12.8 million (33%) represents the foreign exchange cost and \$25.8 million equivalent (67%) the local currency cost (Table 1), including taxes and duties of \$5.5 million. Details are presented in Appendix 6 and Supplementary Appendix C.

Table 1: Cost Estimates^a
(\$ million)

| Project Components | Foreign Exchange | Local Currency | Total |
|--|------------------|----------------|-------------|
| A. Base Cost | | | |
| 1. Participatory Irrigated Agriculture Development | | | |
| a. Participatory Planning and Beneficiary Mobilization | 0.6 | 2.7 | 3.3 |
| b. Irrigation and Associated Infrastructure | 8.7 | 14.3 | 23.0 |
| c. Agriculture and Livelihood Enhancement | 0.5 | 2.5 | 3.0 |
| d. Support for Sustainable O&M | 0.1 | 0.6 | 0.7 |
| 2. Institutional Strengthening and Project Management | 1.2 | 2.8 | 4.0 |
| Subtotal (A) | 11.0 | 23.0 | 34.0 |
| B. Contingencies | | | |
| 1. Physical ^b | 0.1 | 0.4 | 0.4 |
| 2. Price ^c | 0.7 | 2.5 | 3.2 |
| Subtotal (B) | 0.8 | 2.9 | 3.6 |
| C. Interest Charge | 1.0 | 0.0 | 1.0 |
| Total | 12.8 | 25.8 | 38.6 |
| Percent | 33 | 67 | 100 |

^a Figures may not add up to total due to rounding.

^b 5% of base cost except for construction and consulting services.

^c 1.4–2.5% for foreign exchange; and 2.5% for local currency.

Source: ADB estimates.

E. Financing Plan

33. ADB will provide a loan equivalent to \$20.0 million from its Special Funds resources to finance about 52% of the total project cost. The ADB loan will finance \$8.4 million equivalent (66%) of the foreign exchange cost including interest charge and \$11.6 million equivalent (45%) of the local currency cost. The OPEC Fund is requested to finance about 18% of the Project cost. The ADB and OPEC Fund will jointly finance the irrigation and associated infrastructure subcomponent, and the latter will finance \$4.1 million (32%) of the foreign exchange cost and \$2.9 million equivalent (11%) of the local cost. The Government will provide \$9.4 million

equivalent to cover about 24% of the total project cost, comprising \$0.3 million equivalent (2%) of the foreign exchange cost to cover the interest charge for the OPEC Fund loan and \$9.1 million equivalent (35%) for project staff, taxes and duties, and part of the construction. The beneficiary farmers will contribute \$2.2 million equivalent (6% of the project cost) in the form of labor, cash or in kind. The financing plan is in Table 2. Local cost financing is justified given the poverty-oriented nature of the Project and the tight fiscal situation in the country.²³

Table 2. Financing Plan
(\$ million)

| Source of Financing | Foreign Exchange | Local Currency | Total Cost | Percent |
|----------------------------|-------------------------|-----------------------|-------------------|----------------|
| Asian Development Bank | 8.4 | 11.6 | 20.0 | 52 |
| OPEC Fund | 4.1 | 2.9 | 7.0 | 18 |
| Government | 0.3 | 9.1 | 9.4 | 24 |
| Beneficiaries ^a | 0.0 | 2.2 | 2.2 | 6 |
| Total | 12.8 | 25.8 | 38.6 | 100 |

OPEC Fund = Organization of Petroleum Exporting Countries Fund for International Development.

^a Corresponding to 3% and 10% of the cost of diversion and other structures, respectively, for FMIS renovation, and 20% of the cost rehabilitating the damaged schemes.

Source: ADB estimates.

F. Implementation Arrangements

1. Project Management

34. **Organization and Management.** The Ministry of Water Resources (MOWR) will be the Executing Agency, and will carry out its Project implementation responsibilities through DOI. Within this framework, the Ministry of Agriculture and Cooperatives (MOAC) will implement the agriculture component through its delegated authority to DOA, DDCs, and NARC. Project management will be integrated into the regular setup of those organizations. The CPMO is set up under the director general (DG) of DOI. A qualified class I senior engineer having multidisciplinary experience and skills will head the CPMO as project director, with staff assigned from DOI, DOA, Water and Energy Commission Secretariat (WECS), and Department of Local Infrastructure Development and Agriculture Roads (DOLIDAR).²⁴ The CPMO is responsible for facilitating technical support and managing project implementation at the central level. Activities facilitated include (i) endorsing district strategies, SIP, and detailed design; (ii) managing databases such as the FMIS inventory; (iii) imparting national-level training; (iv) managing environmental issues; and (v) implementing relevant policy and institutional actions. For project management, the CPMO will (i) manage an overall implementation plan, annual work plans, and budgets; (ii) maintain financial accounts; (iii) prepare periodic progress reports; (iv) monitor and support field operations; and (v) supervise cross-cutting issues including gender, indigenous peoples, and resettlement. Outside the CPMO, NVC will undertake external technical auditing of the project works. The organization chart is shown in Appendix 7.

35. To provide overall policy guidance and undertake necessary coordination, a project steering committee (PSC) will be formed.²⁵ The secretary of MOWR will chair the PSC, which

²³ If the OPEC Fund loan is not available by 15 July 2005, the Government and ADB will agree on reductions in the scope of work sufficient to cover the shortfall.

²⁴ Including a full-time class II DOI engineer; a class II DOA extension specialist; five class III DOI officers assigned for planning, design, irrigation management, environment, and land issues, among others.

²⁵ The PSC will include MOAC; Ministry of Finance; Ministry of Local Development; Ministry of Women, Children, and Social Welfare; MOWR, National Planning Commission; WECS; NARC; and the relevant departments including Department of Hydrology and Meteorology. ADB staff and ISPM consultants will be invited as observers.

will meet at least once a year, with the project director as member secretary. The project appraisal committee (PAC) will be set up to approve individual SIPs. The DG of DOI will chair the PAC, with the director of Agriculture Extension in DOA, all deputy DGs in DOI as members, the team leader of the ISPM consultants as adviser, and the project director as secretary. In addition, a stakeholder group will be established to coordinate and exchange information on sector reforms and programs supported by external funds. The group will be chaired by the DG of DOI and include members of the PSC, external funding agencies, National Federation of Irrigation Water Users Associations, Nepal (NFIWUAN), and relevant research organizations.

36. At the regional level, the RPSU will be placed in each Regional Irrigation Directorates (RID) of DOI, with assigned staff from RID and Regional Directorate of Agriculture (RDA). The director of RID will head RPSU as project manager for the concerned region. The RPSU will be responsible for (i) managing individual subproject implementation, annual work plans and budgets with reporting from the SMU on cost estimates, tenders, and contract variations; (ii) controlling subproject quality through monitoring, support, and verifying implementation by fielding mobile RPSU teams comprising its staff and ISPM consultants (and staff assigned from DOI offices, private service providers, and NGOs as needed to supplement human resources);²⁶ (iii) supervising resettlement and environmental management with ISPM consultants; and (iv) recruiting private service providers and/or NGOs for preparing SIP and undertaking resettlement and social mobilization activities, while liaising with the CPMO for their respective activities.

37. For day-to-day subproject implementation, an SMU will be established in each district. The chief of the concerned irrigation development division or subdivision (IDD/IDSD) will head the SMU as subproject manager of the district. For districts where no IDD/IDSD exists, another IDD/IDSD staff member will be assigned as deputy subproject manager and work full-time for the SMU. The SMU will also be supported by an agriculture development officer in the District Agriculture Development Office (DADO), a managerial representative from DDC, and other departments relevant to the activities included in the SIP.²⁷ The SMU will undertake all the field activities of the Project from subproject identification to monitoring of completed schemes, by mobilizing and supervising the staff of the concerned public and externally contracted agents including private service providers, NGOs, and contractors. They will also organize regular SMU-WUA meetings for joint decision making and monitoring of project activities.

38. **Support for Devolution of FMIS Development Operations.** The LSGA envisages the devolution of FMIS interventions to LGIs. The new 2003 Irrigation Policy has acknowledged that development works for small FMIS will be the responsibility of LGIs.²⁸ However, necessary human resources and capacities in DDCs and its district technical offices (DTOs) are still in a formative stage,²⁹ and DTOs still cannot meet the procedural and output requirements of the Project. New roles and relationships between DOI and DDC/DTO are also required for quality control, technical backstopping, and capacity development. As a step to promote the devolution process, the DDCs with small feasible FMIS will be responsible for implementing those under the Project, once the necessary irrigation implementation team can be formed. The Team will comprise a class II or III engineer and overseers in the DTO irrigation section, who may be assigned by IDD/IDSD from their staff, with DDC concurrence, along with an account officer and a social mobilizer. Implementation will be supervised by the SMU subproject manager. The

²⁶ Three mobile teams will be formed in each RPSU: two for planning, WUA strengthening, and other support services, and one for implementing civil works.

²⁷ An administrative staff and accountant will also be assigned to the SMU to keep track of all project activities and expenditures by all agencies on a weekly basis, which will be used as a basis for reimbursing the expenditures.

²⁸ Most of FMIS taken up under the SISF were medium-scale, i.e., more than 25 ha in the hills and 200 ha in the terai.

²⁹ DTO, responsible for rural roads, water supply, and other infrastructure, has up to 10 staff positions in each district. Existing staffs are mostly seconded from DOLIDAR, and there are many vacancies.

concerned DDCs will enter into a project agreement with MOWR to delineate specific implementation arrangements. On the other hand, DDCs lacking human resources may request DOI to undertake small FMIS subprojects on their behalf. Based on the initial implementation, a devolution action plan will be prepared at midterm review (MTR) and will be operated thereafter.

39. As for agriculture extension, DADOs have been placed under the DDCs following the 2002 DAIP, along with other services. Thus, district-level programming, implementation, and expenditure authorities are delegated to DDCs. While the SMU will design and arrange for the delivery of agriculture extension and other services through the existing DADO and other subject matter offices, the DDC will take due roles in this process in accordance with the framework of LSGA and DAIP,³⁰ with DOA doing technical backstopping and quality control. The concerned DDCs will also enter into a project agreement with MOAC. Overall, these arrangements will be further assessed and refined during project implementation.

40. **Subproject Selection and Implementation.** Subproject selection criteria are given in Appendix 8. The key criteria are a high proportion of smallholder-operated land, self-sustaining O&M records, enrollment by the majority of farmers, economic viability, and minimal negative environmental and social impacts. Priority is given to areas of high poverty incidence. Implementation procedures are in Appendix 9, and details are in Supplementary Appendix D. They follow the steps for (i) identification, screening, feasibility study, and SIP preparation by SMU for PAC approval;³¹ (ii) WUA institutional development and signing of implementation agreement after WUA achieves the set targets; (iii) WUA beneficiary contribution and construction works managed by SMU and certified by the RPSU; (iv) agriculture and livelihood support arranged by the SMU; (v) postconstruction O&M training arranged by the SMU and program completion confirmed by WUA; and (vi) postcompletion monitoring by WUA and the SMU. NGOs, COs, and private service providers will be engaged to support the process.

41. **Governance and Anticorruption.** Good governance is a critical element for ensuring inclusive FMIS renovation while delivering and sustaining intended benefits. Strengthening the service delivery and management capacity at line agency, DDC, and WUA levels, and using a participatory approach will ensure transparency and accountability. Subproject activities will be endorsed by WUA and overseen by the CPMO through the RPSU and its mobile teams including ISPM consultants and individually recruited monitors, with full disclosure of subproject expenditures at DDC and WUA notice boards. WUAs will be informed of their rights and responsibilities, including monitoring of delivered program quantity and quality—an approach that has proven effective in ensuring work quality in SISP—and the grievance communication system to the concerned DDC and RPSU to redress any problems encountered at field level. The Project also provides consulting services to support and oversee stringent financial management systems at CPMO, RPSU, SMU, and DDC levels, based on the financial management assessment made during the PPTA. Furthermore, external and independent technical auditing by NVC will oversee and advise on technical and financial quality at subproject identification, planning and design, implementation, and O&M stages.

2. Implementation Period

42. The implementation period will be 7 years, starting from April 2005 (Appendix 10). For effective dissemination of improved arrangements, the Project will start with a cluster of up to five districts in each region, where sample subprojects will be selected and prepared with on-

³⁰ There are currently no elected representatives in DDCs since July 2002 when the terms of elected officials expired and new elections were cancelled. At present LGI and line department representatives perform DDC functions.

³¹ Initially, SIPs will be submitted to ADB for approval. Once it has been established that SIPs have achieved the desired level of quality, they will be retained in the CPMO for use by ADB during review missions.

site training of SMU staff in the cluster. After SIP is prepared and WUA is strengthened there, RPSU will start the same process in the next cluster. Seven clusters will cover all the districts.

3. Procurement

43. Goods and related services, and civil works to be financed from the ADB loan will be procured in accordance with ADB's *Guidelines for Procurement*.³² As contracts are expected to be very small, international contractors are not likely to be interested and international competitive bidding will not be required. Equipment and materials as well as service vehicles packaged and valued at less than \$100,000 equivalent may be procured by direct purchase procedures. Civil works will be procured through local competitive bidding.³³ Simple civil works contracts costing less than NRs2.5 million (about \$33,000) may be awarded to the concerned registered WUAs. Contractors must have satisfactory postqualification records that will be annually updated by RID. Indicative contract packages are shown in Appendix 11.

4. Consulting Services

44. The Project will require consulting services for improved subproject management with on-the-job training, technical support, and support for quality control. A total of 55 person-months of international and 519 person-months of domestic consulting services will be acquired through a firm. The terms of reference are outlined in Appendix 12 and detailed in Supplementary Appendix E. The consultants will be selected in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for engaging domestic consultants, through quality- and cost-based selection procedures. The Government will undertake advance action in recruiting consultants. The Government has been advised that approval of advance action does not commit ADB to finance the Project. In addition, the services of NGOs, COs, and private firms and individuals are required to carry out project activities including district irrigated agriculture strategies, participatory rapid rural appraisal, feasibility studies, SIP preparation, WUA mobilization, construction supervision, agriculture development and livelihood enhancement activities, support for O&M processes, resettlement management, and monitoring and evaluation (M&E). Technically qualified domestic service providers will be engaged, using selection procedures acceptable to ADB.

5. Disbursement Arrangements

45. The Government will establish two project accounts at the Nepal Rastra Bank (NRB) after the loan agreement becomes effective: one for agriculture extension and research, and the other for irrigation and other development support. Proceeds from the ADB loan funds will be maintained in a separate bank account with NRB and will only be used to pay ADB's share of eligible project expenditures. Funding for irrigation will be channeled into the project operating accounts for CPMO, RPSU, and SMU for subprojects implemented by the SMU, and into the accounts for DDC (through the district development fund) for small subprojects implemented by DDC. Funding for agriculture will be channeled into the project operating accounts for DOA, NARC, RDA, and DDC (through the district development fund).

46. ADB funding of the Project will be periodically disbursed from the ADB loan account into a subaccount of the project account for irrigation, which will operate as an imprest account for the ADB funding. The imprest account will be managed by DOI/CPMO in accordance with ADB's *Loan Disbursement Handbook* (January 2001), and detailed arrangements agreed to by

³² Nepal's Public Works Directive for procurement procedures was reviewed by ADB and found acceptable.

³³ Civil works contracts costing \$50,000 or less will be awarded on a post-facto review basis.

the Government and ADB. The initial amount of the loan proceeds released to the imprest account will not exceed 6 months of estimated expenditures and not more than 10% of the total loan amount. ADB's statement of expenditures (SOE) procedures will be used for reimbursing eligible expenses and liquidating advances from the imprest accounts for individual payment transactions not **exceeding \$50,000**. Direct payment procedures will be used for expenditures incurred in contracts for consulting services.

6. Accounting, Auditing, and Reporting

47. DOI/CPMO will maintain separate records and accounts adequate to identify the goods and services financed from the loan proceeds, the financing resources received, expenditures incurred for the Project, and the use of local funds, in accordance with generally accepted accounting principles. The project accounts and related financial statements will be compiled by DOI/CPMO and audited annually by independent auditors acceptable to ADB. The annual audit will include the audit of the imprest account and SOE procedures, and a separate audit opinion on the use of the imprest account and SOE procedures should be included in the annual audit report. The audited accounts, audit report, and related financial statements will be submitted to ADB not later than 9 months after the close of the fiscal year to which they relate. The CPMO will also prepare and submit quarterly progress reports. A project completion report will be prepared and submitted to ADB within 3 months after physical completion of the Project.

7. Project Performance Monitoring and Evaluation

48. Project performance M&E will be carried out by the CPMO. The M&E system will comprise (i) subproject-level baseline data collected during SIP preparation and kept in the M&E section of DOI; (ii) implementation-related monitoring of subproject preparation and implementation status, collected and reported by SMU and managed by RPSU and CPMO; and (iii) postcompletion impact data, to be collected and reported by WUAs and maintained in the M&E section in DOI. The system will establish a set of monitorable indicators including the impacts disaggregated by gender, ethnicity, caste, landholding size, and tenancy status. WUAs will be trained to monitor their performance, which will be verified by the concerned IDD/IDSD during the performance audit. Within this framework, the CPMO will improve the management information system with the support of ISPM consultants within 1 year of loan effectiveness, which will be consistent with a participatory and gender-sensitive performance monitoring system in ADB. (The outline framework is in Supplementary Appendix F). The CPMO will prepare and submit annual benefit monitoring reports to ADB. A detailed study will be conducted to review project progress before the MTR. The CPMO will complete an impact evaluation study in preparing the project completion report.

8. Project Review

49. ADB will review the Project at least twice a year. The regular project reviews will assess the performance of DOI and other institutions with respect to the Project; implementation of the policy and institutional action plans, loan covenants, and gender action plan; and physical progress of project implementation. A comprehensive MTR in year 3 will evaluate (i) project progress including design, stakeholder participation, quality of SIP, WUA strengthening, design, construction, and agriculture and livelihood enhancement services; (ii) economic, social, gender and environmental impacts and management; (iii) effectiveness of the project management and implementation arrangements; (iv) progress on policy and institutional actions enumerated in the policy matrix; and (v) future implementation plan and targets. Appropriate adjustments to the project design and implementation arrangements will be made as necessary.

IV. PROJECT BENEFITS, IMPACTS, AND RISKS

A. Economic Impacts

50. At full development, the Project will rehabilitate 25,500 ha of low-productivity FMIS and irrigate an additional 8,500 ha of previously rain-fed land. About 270,000 people will benefit from improved livelihood. The main quantifiable benefits will be the incremental agriculture production brought about by a more reliable water supply during the monsoon season and the expanded winter and spring irrigated area. The generated incremental labor demand will particularly benefit the poor. Major quantifiable benefits are shown in Appendix 1. Non-quantifiable benefits include operation of sound service delivery systems for FMIS renovation and improved sector governance promoted through sector-wide policy and institutional reforms.

51. Economic and financial analyses were carried out for three sample subprojects to evaluate the returns on project investments (summarized in Appendix 13 and detailed in Supplementary Appendix G). The Harinmari subproject in Mahottari District in the terai covers 255 ha while the Talkharka and Inglakhola subprojects in Ilam District in the hills cover 210 ha and 178 ha, respectively. All have year-round irrigation opportunities in the basin, and cropping intensity is expected to rise to around 200% when some 70% of land in winter and 30% in spring will be irrigated, in light of the existing cropping pattern and farmer willingness survey.³⁴ The estimated economic internal rate of return (EIRR) is 23% for Harinmari, 24% for Talkharka, and 25% for Inglakhola. Sensitivity analyses to test the impacts of a range of risks including adverse changes in investment costs, output prices, and yields showed that project returns are generally robust. The greatest risk appears to be reduction in price of cereal crops in Harinmari, but even in this case a drop of 35% in the price of food grains will still produce an EIRR of 12%.

B. Household and Poverty Reduction Benefits

52. The Project will have direct positive poverty reduction impacts on income, employment opportunities including those for tenant farming (arising from labor constraints experienced by larger farmers), and food security. According to the socioeconomic survey, poverty incidence in the three subproject areas is 54–62%, with the national ethnic minority population accounting for the majority of beneficiaries cutting across all farm size categories.³⁵ Anticipated per hectare incremental incomes for small farmers are in the range of 60–80% of without the Project levels. Distribution analysis indicates that the poor may attain a total of about 39–51% of direct benefits. They will also have greater food security, i.e., the percentage of food grain production against house consumption for small farmers will improve from 90–165% to 150–240% in the irrigated area, and from 45–80% to 130–145% in the currently rain-fed area.

C. Gender and Social Strategy

53. In irrigation systems, access to water is closely related to the social context and power structures. Differential access reflects existing social relationships, in terms of caste or ethnicity and gender. While physical FMIS improvements give an opportunity to establish equal rights to irrigation water use through collective works, this has not received due attention. This is due to the subordination of strengthening WUAs to construction work, with the erroneous assumption that physical improvement will induce the necessary user capacity to manage the renovated

³⁴ Expected impacts in terms of changes in cropping pattern, intensity, and yields were cross-checked with those observed in FMIS in previous projects. Comparable levels were assumed for the purpose of the economic analysis.

³⁵ Most farmers are near poor if not poor, with less than 20–30% having a net income more than double the calorie-based poverty line (equivalent to \$0.4 per capita per day), and are vulnerable to calamities.

systems. In addition, poverty has forced male migration and created new challenges in the distribution of water use rights. The Project will promote new approaches to more equitable resource distribution and modification of gender relations. They include (i) policy measures to equalize opportunities and access to irrigation; (ii) increase in WUA capacity to promote good governance such as representation, participatory decision making, and equitable benefit distribution; (iii) specific actions and programs that target women and disadvantaged groups; and (iv) compliance with social safeguard measures before initiating any construction work.

54. Since women make up the bulk of farm labor with a decision-making role in family agriculture activities, the role of women in WUAs will be enhanced to maximize irrigation benefits. The Project will focus on complementarity and reciprocity between men and women, identifying barriers that may negatively affect women's ability to interact as equal partners. In line with the 2003 Irrigation Policy, the Project will (i) promote at least 33% women's participation in WUAs; (ii) assist DOI, DOA, and DDC to implement a gender action plan; (iii) require all training activities to have a session on gender issues; (iv) strengthen linkages with the Department of Women's Development and DADO for WUA training; (v) facilitate gender mainstreaming activities by establishing gender focal points; (vi) require all data to be gender-disaggregated; and (vii) request NGOs to have 50% women field staff. Appendix 14 gives the summary poverty analysis and social strategy and Appendix 15, the gender action plan.

D. Resettlement

55. In accordance with ADB procedures for sector lending, three sample subprojects were studied to assess land acquisition and resettlement needs of the Project in renovating FMIS. A resettlement framework (RF) and sample resettlement plans (RPs) were prepared (summarized in Appendixes 16 and 17, with full documents in Supplementary Appendixes H and I). by the Government, following ADB's involuntary resettlement and other social safeguards policies. Subproject implementation will generally require the use of land for widening and expanding canals, although the scope is limited due to strip acquisition. Under the Project, the RF will be followed, and all affected persons will be entitled to compensation for land taken for the purpose of the project interventions, for their lost assets; and incomes at replacement cost to improve or at least restore their pre-project living standards, income levels, and productive capacity. Existing social practices, however, show landowners voluntarily contributing the canal land in FMIS construction in recognition of benefits such as priority access to irrigation water and increased land price, against the insignificant impacts. Voluntary contribution may therefore be considered an acceptable option when agreed to by the concerned persons and confirmed by a third party. The RPSU will supervise RP preparation and implementation by the concerned SMU, with support from the ISPM consultants and NGOs.

E. Indigenous Peoples

56. Indigenous peoples issues were found insignificant in the three sample subprojects, where the beneficiary group comprises an ethnic local majority but a national minority. Preparing indigenous peoples specific actions was not deemed necessary. The Project is designed to be inclusive as it targets areas with high percentages of ethnic groups. Where small disadvantaged ethnic or caste groups are identified, ADB's *Policy on Indigenous Peoples* will be applied and will build on the organizational model of each ethnic group's FMIS. Safeguards for inclusiveness include subproject selection criteria that will require the WUA management committee to constitute the same proportion of its social profile as the population of the WUA or larger. The feasibility study of the sample subprojects shows it unlikely that the project will have any negative impacts on ethnic minorities. However, sample indigenous peoples specific actions

(IPSA) was prepared as a precautionary measure that will be integrated in the SIP (Supplementary Appendix J).

F. Environmental Impacts

57. An initial environmental examination (IEE) was carried out during the PPTA. The summary IEE is in Appendix 18. (The IEE is in Supplementary Appendix K.) The Project will have overall beneficial impacts, enhancing agricultural production while reducing pressure on the environment through reduced use of wood products for temporary structures. Potential negative impacts identified include (i) reduced water availability to the downstream water users and ecosystems, and possible conflicts among water users; (ii) land acquisition and resettlement; (iii) induced erosion and landslides along the canals; and (iv) impacts associated with increased use of agrochemicals, and of irrigation water that may cause waterborne diseases. These impacts will be mitigated by (i) avoiding subprojects that affect downstream users or ecosystems through basin water assessment and user consultation; (ii) operation of agreed upon RF; (iii) slope protection with the bioengineering approach or avoiding schemes in landslide zones; and (iv) promoting environmentally sound agriculture practices and hygiene education. Under the Project, an IEE will be prepared for each subproject, and any short-term negative impacts will be mitigated following the environmental management plan (Supplementary Appendix L).³⁶

G. Risks

58. The Project has several risks that could adversely affect effective implementation and sustainable benefits. It has incorporated mitigating measures to the maximum extent possible.

59. **Insurgency.** The ongoing insurgency presents a considerable risk. However, the Project has incorporated such specific measures that have proven effective in pursuing development works in conflict environments: (i) flexible site selection following local conditions; (ii) careful security monitoring with staff trained to work with insurgency; (iii) improving community infrastructure supported by genuine WUA interest, while mobilizing strong community support to and trust in the project staff; (iv) fully participatory and transparent implementation including disclosure of financial information; (v) incorporating specific programs for ethnic minorities and dalit in the livelihood enhancement subcomponent; and (vi) increasing service delivery through local NGOs and consultants less vulnerable to conflicts. The Project will also start operating in areas with a relatively more secure environment and expand coverage while establishing models that could operate in more conflict-affected conditions. Nevertheless, seriously worsening local conflicts (that would essentially affect all development programs) may still disrupt the project activities and affect subproject implementation period and benefits, although core subprojects have demonstrated robustness with delayed benefits.³⁷

60. **WUA Sustainability.** Ensuring WUA sustainability is critical to maintain benefits through effective O&M. Some WUAs may become less active when the routine maintenance needs (such as frequent repair of diversion works) are reduced after structure improvement. Their capacity to cope with specific maintenance needs that arise may be affected. To address this risk, the Project will select viable WUAs having a proven track record for sustained O&M, and provide due capacity strengthening support for routine O&M and for their development from routine maintenance groups to viable community agents to pursue agriculture development, i.e.,

³⁶ IEEs will be attached to SIPs and submitted to ADB for review and endorsement at the initial stages. Once the quality of IEEs is confirmed, they will be retained in CPMO for use by ADB during review missions.

³⁷ They remain economically viable with full benefits delayed by over 7 years (Appendix 13).

to promote efficient water use and improved cropping practices while facilitating the linkage to external service providers and marketing agents with collective bargaining power.

61. **Interagency Coordination and Governance.** Delivering quality services with effective interagency coordination and governance is critical in sustaining project benefits by WUAs. This will be addressed by strengthening the management, monitoring, and quality control systems of the project institutions, and the participatory approach to project planning and implementation. Interagency coordination will be attained through district SMUs comprising the concerned agency representatives who plan and manage the designated activities embodied in SIPs. Provision of individual services will be jointly decided in regular SMU-WUA meetings and monitored by WUAs, under supervision by the RPSU and the ISPM consultants. The Project will also apply external technical audits to monitor and advise on the quality of service.

62. **Implementation Delay.** The Project may face implementation delay due to the lower-than-expected performance of the field-level activities, including WUA development that may be difficult to manage from outside, due to the demand-driven and self-help nature of the process. To cope with the risk, the Project will identify WUAs with genuine interest and proven capacity for sustained O&M, and will have a larger number of subprojects at the preconstruction stage compared with the annual construction targets.

V. ASSURANCES

A. Specific Assurances

63. In addition to the standard assurances, the Government has given the following assurances, which are incorporated in the legal documents:

- (i) The Government will undertake all time-bound policy and institutional actions as specified in Appendix 5, agreed upon with ADB.
- (ii) The Government will ensure that all subprojects meet, to the satisfaction of ADB, the selection criteria and implementation arrangements and procedures as specified in Appendixes 7–9 and as agreed upon with ADB during appraisal.
- (iii) If cofinancing by OPEC Fund has not been obtained in a timely manner, the Government will adjust the scope and costs of the Project in agreement with ADB.
- (iv) By the end of year 2 of loan effectiveness, the Government will have established a sufficient regular budget to support the rehabilitation of completed FMIS damaged by natural disasters beyond the scale envisaged within the design return period. The Government will ensure that the share of ADB funding will be phased out each year starting from 50% in year 3 of loan effectiveness and reduced by 20% in year 5 and in year 7, respectively, with farmers' contribution fixed at 20% of the construction cost. DOI will ensure that the fund will be allocated on the basis of sufficient matching fund provided by the concerned WUA from its emergency reserve fund.
- (v) The Government will ensure that land acquisition and resettlement activities are implemented in accordance with all applicable laws and regulations of the Government, and ADB's *Policy on Involuntary Resettlement* (1995), and the agreed-upon RF and RP (Appendixes 16 and 17). DOI will not approve any subproject unless the concerned RP as required has been submitted to and approved by DOI and ADB. DOI will not award any contract unless the RP has been fully implemented.
- (vi) The Government will ensure that adequate environmental mitigating measures are incorporated into all subproject design, construction, operation, maintenance and monitoring arrangements in accordance with (a) *Environmental Policy of the Asian Development Bank* (2002), (b) the Government's environmental laws and

- regulations, and (c) subproject specific environmental assessment and review procedures and arrangements agreed with ADB. DOI will ensure that IEEs will be included in the subproject feasibility study reports. When IEE requires preparation of an environmental impact assessment (EIA) report, such EIA report should be endorsed by DOI and submitted to ADB for concurrence before subproject approval, without which no subproject will be approved by the Government.
- (vii) Where issues related to indigenous peoples are identified during project implementation and subproject preparation, DOI will ensure that ADB's *Policy on Indigenous Peoples* will be closely followed and the measures indicated in the indigenous peoples specific actions agreed upon with ADB is integrated in the SIPs.
 - (viii) The Government will ensure (a) achievement of at least 33% representation by women in WUAs on average, (b) implementation of the gender action plan in Appendix 15, and (c) due representation of disadvantaged groups (ethnic minorities and dalit) in WUAs in accordance with the FMIS household distribution.

B. Conditions for Loan Effectiveness

64. In addition to the general conditions, the Government will have established the CPMO and appointed the key staff before the loan becomes effective.

C. Conditions for Withdrawals from the Loan Account

65. No withdrawals from the loan account will be made until the Government will have entered into a contract with the ISPM consultants, except for the expenditures for equipment and supplies, training, survey, monitoring, and project management required to prepare for project implementation. No disbursement for/to DDC for their eligible expenditures will be made until a project implementation agreement (DDC agreement) or alternative arrangements, acceptable to ADB, are established between MOAC and the concerned DDC for the agriculture extension component, and between MOWR and the concerned DDC for small FMIS rehabilitation that is implemented by the DDC.

VI. RECOMMENDATION

66. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

- (i) the loan in various currencies equivalent to Special Drawing Rights 13,615,000 to the Kingdom of Nepal for the Community-Managed Irrigated Agriculture Sector Project, from ADB's Special Funds resources with an interest charge at the rate of 1% per annum during the grace period and 1.5% per annum thereafter; a term of 32 years, including a grace period of 8 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan Agreement presented to the Board; and
- (ii) the administration by ADB of a loan not exceeding \$7,000,000 to the Kingdom of Nepal for the Community-Managed Irrigated Agriculture Sector Project to be provided by the OPEC Fund for International Development (OPEC Fund) under the terms of a Letter of Agreement to be entered into between ADB and the OPEC Fund.

Tadao Chino
President

26 October 2004

PROJECT FRAMEWORK

| Design Summary | Performance Indicators/Targets | Monitoring Mechanisms | Assumptions |
|---|---|---|---|
| <p>Sector/Area Goal</p> <p>Promote inclusive economic growth and reduce poverty in the rural areas of Central and Eastern Development regions.</p> | <ul style="list-style-type: none"> • Poverty incidence in rural households in subproject areas is reduced by over 15%. • Farmers having 0.25–0.5 ha of land achieve over 100% food self-sufficiency on average. • Livelihood of poor ethnic or caste groups improves, demonstrated by better HDIs. • Similar interventions are widely replicated, thereby accelerating agriculture growth, confirmed in district-level statistics. | <ul style="list-style-type: none"> • National and district statistics on agriculture, incomes, and HDIs • BME reports • GLE progress reports • Gender and ethnicity/caste differentiated district baseline surveys | |
| <p>Purpose/Objectives</p> <p>Enhance agricultural productivity and sustainability of existing FMIS, thereby enhancing the livelihood of poor men and women by:</p> <p>(i) Providing improved measures for WUA mobilization, infrastructure, agriculture development and targeted livelihood enhancement to build the human capital of the poor including women and disadvantaged groups and other support services; and</p> <p>(ii) Strengthening policies, plans, institutions and operational mechanisms for more responsive service delivery and sustained impacts.</p> | <p>Following results achieved in subproject areas by 2015, with individual subproject targets fixed in SIPs and monitored:</p> <p>(i) Cropping intensity increases by 40%.</p> <p>(ii) Annual cereal, potato, and cash crop production increases by at least 51,000 t; 33,000 t, and 14,000 t.</p> <p>(iii) Gross margin per farm family increases by 70%.</p> <p>(iv) Permanent employment increases by 3.3 million days.</p> <p>(v) Annual family income of landless farm laborers increases by over NRs2,000.</p> <p>Following institutional performance achieved:</p> <p>(i) Individual outputs for institutional actions (Component/ Output B.1.) are operated.</p> <p>(ii) Improved FMIS support system is operated.</p> <p>(iii) DOI capacity is established to execute 4 FMIS subprojects per district at a time.</p> <p>(iv) DOA and DDC are capable of providing due services in each FMIS subprojects.</p> <p>(v) WUA are functioning effectively to enhance community livelihood, with increased women and ethnic/caste representation.</p> <p>(vi) DOI prepared, endorsed, and implemented policy on gender and development.</p> | <ul style="list-style-type: none"> • BME reports • National statistics • Project progress and completion reports • Consultants' reports • GLE progress reports <ul style="list-style-type: none"> • Project progress and completion reports • Consultants' reports • DOI database of completed schemes • Evaluation reports by independent agents | <ul style="list-style-type: none"> • Political conditions remain conducive. • Project institutions are willing to strengthen FMIS improvement. • WUA are willing to strengthen institutional basis while managing the facilities effectively. • WUA are willing to adopt modern cropping patterns. • Damages from natural disasters are manageable, or timely rehabilitated. <ul style="list-style-type: none"> • Political conditions remain conducive. • Project institutions are willing to strengthen systems for FMIS improvement. • WUA are willing to strengthen institutional basis adopting new cropping practice. • Necessary system is operational to monitor performance. • Leadership and support within and outside DOI. |

Continued on next page

| Design Summary | Performance Indicators/Targets | Monitoring Mechanisms | Assumptions |
|---|---|---|--|
| <p>Component/ Output A. Irrigated Agriculture Development for FMIS 1. Participatory Planning and Beneficiary Mobilization</p> <p>(i) Participatory strategy formulation, screening, identification, and preparation of SIPs through feasibility studies</p> <p>(ii) Viable WUA strengthened to become effective community organization ready to receive investment support and to enhance agriculture production</p> | <ul style="list-style-type: none"> • Irrigated agriculture development strategy is formulated in each of the 35 districts. • 210 subprojects are appraised, with concrete SIP with WUA endorsement. • 210 WUAs strengthened, with achievement of targets: <ul style="list-style-type: none"> - Over 80% farmers enrolled - Officially registered, with gender-responsive rules - O&M improved as per SIP. • 210 implementation MOAs signed. • 33% women's representation. | <ul style="list-style-type: none"> • Project progress and completion reports • Consultants' reports • Field monitoring report • ADB review missions • GLE progress reports <p>(Same as above)</p> <ul style="list-style-type: none"> • WUA constitution and its rules | <ul style="list-style-type: none"> • Participatory process is duly followed by all. • Monitoring and quality support are effective. • Beneficiaries support collective action. <p>(Same as above)</p> |
| <p>2. Irrigation and Associated Infrastructure Good quality infrastructure designed and constructed, conforming to district strategy and SIP</p> | <ul style="list-style-type: none"> • WUAs endorse detailed designs in 210 subprojects. • RPs are implemented. • WUA completed beneficiary contribution. • Irrigation and associated infrastructure are completed, with WUA monitoring. | <p>(Same as above)</p> | <ul style="list-style-type: none"> • Participatory process is duly followed by all. • Monitoring and quality support are effective. • WUAs comply with the beneficiary contribution requirements. |
| <p>3. Agriculture Development and Livelihood Enhancement</p> <p>(i) Agriculture extension and livelihood enhancement support services provided as specified in SIPs and targets set up therein achieved</p> <p>(ii) Demonstration of innovative small-scale irrigation provided focusing on the poor communities</p> | <ul style="list-style-type: none"> • 210 WUAs achieve specific SIP targets in cropping pattern and intensity, inputs and yield levels. • WUAs continue extension with trained members and seed money generated. • Targets for livelihood enhancement as set out in 210 SIPs are achieved, in terms of program delivery and income levels of beneficiaries. • 20% subprojects successfully brought MFI NGO to start microcredit activities. • At least 35% women participate in programs. • Facilities are provided targeting about 1,000 ha of land with 50,000 poor families. • Income level of beneficiaries increases by over 100%. | <p>(Same as above)</p> <p>(Same as above)</p> | <ul style="list-style-type: none"> • Project institutions appreciate the value of participatory approach. • Effective monitoring and quality support. • WUA member willingness to adopt improved cropping practices. <p>(Same as above)</p> |
| <p>4. Support for Sustainable O&M Systems become operational</p> | <ul style="list-style-type: none"> • WUAs prepare and implement effective O&M plans. • WUAs increase emergency maintenance fund as per SIP specification. | <p>(Same as above)</p> <ul style="list-style-type: none"> • DOI database for completed schemes | <ul style="list-style-type: none"> • Logistical support provided by the Government to operate regular audit mechanisms is sufficient. |

Continued on next page

| Design Summary | Performance Indicators/Targets | Monitoring Mechanisms | Assumptions |
|--|---|--|---|
| | <ul style="list-style-type: none"> Completed FMIS database set up and regularly updated. Gender/ethnicity/caste disaggregated MIS linked from field to center. Regular WUA audit system made functional within DOI. Schemes suffered from major damages rehabilitated. DOI regular budget for rehabilitation established. | | <ul style="list-style-type: none"> Project staff are willing to monitor the completed schemes. |
| <p>B. Institutional Strengthening and Project Management</p> <p>1. Support for National-Level Institutional Strengthening</p> <p>(i) Advisory support provided to agriculture sector programs</p> <p>(ii) Advisory support provided to promote water resources sector reforms</p> <p>(iii) Advisory support provided to promote irrigation policy, plan, and institutional strengthening</p> | <ul style="list-style-type: none"> Review and advice are provided on initiatives supported under 2nd ASPL. IWRM policy, NWP, and IWRM institutions are finalized following the advice provided. Irrigation policy and long-term investment plan are updated. DOI institutional vision and strategy are finalized and implemented. Action plan for improved human resource management is implemented. Budgetary and financial management is improved. Internal quality control system is reviewed and improved. External technical audit system is operated. | <ul style="list-style-type: none"> Project progress and completion reports Consultants' reports ADB review missions <p>(Same as above)</p> <p>(Same as above)</p> | <ul style="list-style-type: none"> Political and institutional support is sufficient. Recruitment of consultants is timely. <p>(Same as above)</p> <p>(Same as above)</p> |
| <p>2. Operation of Improved FMIS Intervention Mechanisms</p> <p>Effective operation of project institutions to provide necessary services with improved procedures and arrangements, including</p> <ul style="list-style-type: none"> Central line agencies LGIs (DDCs, VDCs) WUAs Private firms and agents NGOs and COs | <ul style="list-style-type: none"> Improved FMIS guidelines and manuals are operated. Accountability measures for project institutions (regular SMU-WUA meetings, sub-project monitoring by WUAs, etc.) are operating. WUA management committee represents social and gender mix and is operational, and exercising responsibilities. | <ul style="list-style-type: none"> Detailed operational procedures and arrangements Project progress and completion reports Consultants' reports ADB review missions WUA record books GLE progress reports | <ul style="list-style-type: none"> Project institutions are supportive. Sufficient counterpart fund is provided. Stakeholders are willing to participate. Recruitment of consultants and other organizations is timely. |
| <p>3. Training</p> <p>Capacities of project institutions, stakeholders, and their representatives strengthened through training</p> | <ul style="list-style-type: none"> CDP is prepared and effectively implemented. Project institutions are fully operational through effective project management support. | <p>(Same as above)</p> <ul style="list-style-type: none"> CDP CDP implementation report (by consultants) | <ul style="list-style-type: none"> Effective training is provided. Capacities developed are retained. Recruitment of consultants and other organizations is timely. |

Continued on next page

| Design Summary | Performance Indicators/Targets | Monitoring Mechanisms | Assumptions |
|---|--|--|---|
| Activities/Inputs | Schedule and Input Resources | | |
| A. By Government (i) Implement actions for policy and institutional strengthening (ii) Operate project institutions and implement the Project with external support organizations (iii) Strengthen project institutions with consultants | 2005–2011 <ul style="list-style-type: none"> • Impart training with NGOs and private firms: \$1.16 million • Research: \$0.28 million • Incremental staff, operating, and other implementation expenses: \$2.03 million • Mobilize of counterpart fund. | <ul style="list-style-type: none"> • DOI and DOA annual reports • Project progress and completion reports • Consultants' reports • ADB review missions | <ul style="list-style-type: none"> • Borrower complies with loan covenants. • Capacity development is sufficient. • Decisions are timely. • Other line departments cooperate. |
| B. By Consultants Capacity development and project management, including (i) Support for operation of FMIS intervention system (ii) Support for institutional development activities, and (iii) Capacity development and organizing training | 2005–2011 <ul style="list-style-type: none"> • 55 person-months of international and 519 person-months of domestic consultants: \$3.30 million | <ul style="list-style-type: none"> • Project progress and completion reports • Consultants' reports • ADB review missions | <ul style="list-style-type: none"> • Personnel are strong, capable, and efficient. • Design and supervision are efficient. • Relations with project institutions are effective. |
| C. By Support Organizations 1. NGO/ CO/ Private firms (i) Support for COs (ii) Preparing FMIS inventories (iii) District/basin strategies (iv) Feasibility studies and SIPs (v) Undertaking RPs and IEEs (vi) Facilitate WUA strengthening (vii) Detailed design activities (viii) Monitoring of subproject (ix) Training 2. Contractors and Suppliers (i) Construction works (ii) Equipment and supply | 2005–2011 <ul style="list-style-type: none"> • WUA Social mobilization and training: \$0.35 million • Training and capability building: \$1.15 million • Survey and investigation: \$2.16 million • Monitoring and Evaluation: \$0.76 million <ul style="list-style-type: none"> • Civil Works: \$20.79 million • Equipment and supply: \$1.98 million | (Same as above) | (Same as above) |
| D. By WUA (i) Participation in information campaign, survey, feasibility studies, and SIP preparation (ii) Participation in design and construction monitoring (iii) Mobilization of resources for capital cost contribution (iv) Implementation of earth works (v) Irrigation facility O&M | (2005–2011) <ul style="list-style-type: none"> • Earth works: \$3.67 million • Regular O&M: (\$1.90 million) • Local resource mobilization for capital cost contribution: (\$2.19 million) | (Same as above) | (Same as above) |
| Project Cost | <ul style="list-style-type: none"> • Interest during construction \$0.95 million Total \$38.57 million | | |

ADB = Asian Development Bank, ASPL = Agriculture Sector Program Loan, BME = benefit monitoring and evaluation, CDP = capacity development plan, CO = community organizer, DDC = district development committee, DOA = Department of Agriculture, DOI = Department of Irrigation, FMIS = farmer-managed irrigation system, GLE = gender and livelihood enhancement; ha = hectare, HDI = human development index, IEE = initial environmental examination, IWRM = integrated water resources management, LGI = local governance institution, MFI = microfinance institution, MIS = management information system, MOA = memorandum of agreement, NGO = nongovernment organization, NWP = national water plan, RP = resettlement plan, SIP = subproject implementation plan, SMI = subproject management unit, t = ton, VDC = village development committee, WUA = water user association.

**EXTERNAL ASSISTANCE TO AGRICULTURE AND IRRIGATION
(1995–2003)**

| Funding Source | Project Title | Amount (\$ million) | | |
|----------------|---|---------------------|------|---------|
| | | Grant | Loan | Year |
| ADB | Irrigation Management Transfer | | 12.9 | 1995 |
| | Second Irrigation Sector | | 25.0 | 1996 |
| | Rural Infrastructure Development | | 12.2 | 1996 |
| | Third Livestock Development | | 18.3 | 1996 |
| | Second Agriculture Program | | 50.0 | 1998 |
| | Community Groundwater Irrigation Sector | | 30.0 | 1998 |
| | Rural Microfinance | | 20.0 | 1999 |
| | Community Livestock | | 20.0 | 2003 |
| Australia | Community Forestry (Phase 5) | 7.8 | | 1997 |
| Canada | Community Shallow Tubewell Development | 2.8 | | 1999 |
| Denmark | National Dairy Development Board | 2.0 | | 1996 |
| | Watershed Management | 2.4 | | 1996 |
| | National Resource Management Sector Assistance | 19.1 | | 1996 |
| European Union | Strengthening of Veterinary Services for Livestock | 9.8 | | 1995 |
| | Irrigation Development Program | 9.4 | | 1997 |
| | Bagmati Watershed Management (Phase 2) | 15.0 | | 1997 |
| FAO | Small Marketing Infrastructure | 3.8 | | 1995 |
| | Integrated Pest Management for Rice (Phase 2) | 1.0 | | 1999 |
| | On-farm Water Management | 1.2 | | 1999 |
| Finland | Forest Resource Information System | 1.8 | | 1997 |
| Germany | Biogas Program | 3.1 | | 1998 |
| IFAD | Community Shallow Tubewell Irrigation | | 9.9 | 1995 |
| | Poverty Alleviation in West Nepal | | 8.8 | 1997 |
| Japan | KR2 Grant Program | 27.6 | | 1995-99 |
| | KR2 Grant Program | 17.8 | | 2000-03 |
| Netherlands | Karnali Local Development | 5.1 | | 1995 |
| | Biogas Support Program (Phase 3) | 5.8 | | 1997 |
| | Mechi Hills Development | 3.0 | | 1998 |
| Switzerland | Community Forestry | 2.8 | | 1997 |
| | Sustainable Soil Management | 1.2 | | 1998 |
| | Hill Maize Research | 2.8 | | 1999 |
| United Kingdom | Hill Agriculture Research Foundation Year | 4.3 | | 1995 |
| | Hill Agriculture Research | 18.8 | | 1996 |
| | Seed Sector Support | 5.2 | | 1997 |
| | District and National Implementation of Nepal's APP | 13.7 | | 2002 |
| United States | Environment and Forest Enterprise Activities | 8.8 | | 1995 |
| | Market Access for Rural Development | 7.7 | | 1996 |
| | Irrigation Management Transfer | 6.0 | | 1996 |
| | Agro-enterprise Development | 1.5 | | 1996 |
| | Forest and High-Value Agriculture Products | 25.0 | | 1997 |
| World Bank | Agriculture Research and Extension | | 24.3 | 1997 |
| | Nepal Irrigation Sector | | 79.8 | 1997 |
| WFP | Rural Community Infrastructure Works | 21.0 | | 1995 |

ADB=Asian Development Bank, APP = Agriculture Perspective Plan, FAO=Food and Agriculture Organization, IFAD=International Fund for Agricultural Development, WFP=World Food Program.

Source: Asian Development Bank.

INCORPORATION OF LESSONS LEARNED FROM PAST PROJECTS

| Lessons Learned from ADB-assisted Projects | Incorporated Lessons Learned |
|--|---|
| A. Policy-related Issues | |
| Project implementation should be conducive to the relevant policy and institutional reforms and assist their progress with monitoring and advisory support. (SISP) | Relevant policy and institutional reform agendas and action plans were agreed on and included as Appendix 5, to be followed up during project implementation. |
| B. Project Institutions | |
| 1. Department of Irrigation | |
| a. DOI's capacity in promoting beneficiary participation needed strengthening (BOISN). Its social staff resources are insufficient, and capacity in addressing poverty and social agenda needs strengthening (SISP). | a. The Project will engage NGOs and COs to facilitate the WUA strengthening activities. Capacity development support will also be provided through consultants to address the new poverty and social agendas. |
| b. Monitoring and evaluation framework within DOI was weak (BOISN). In SISP, subproject quality control was insufficient in initial years. Sufficient attention and resources should be provided in monitoring and evaluation (M&E) of completed schemes (SISP). | b1. Quality control will be improved through (i) stronger internal control with more intensive supervision, (ii) WUA empowerment, and (iii) external technical audit. b2. The Project will institutionalize benchmarking at sub-project planning, and M&E of completed FMIS. |
| c. Inadequate linkages with DOA hampered integrated agriculture development (BOISN, RIP). Coordination with providers of agricultural services remains an issue (ISP, ERIP, SISP). | c. The Project will ensure joint preparation of SIP that stipulates specific activities, schedule, and institutional responsibilities, to be agreed to in writing by all the concerned parties. |
| 2. Department of Agriculture | |
| Agricultural extension staffs lack the ability to respond to the needs of local farmers (BOISN). DOA staff skills to form farmer groups remains weak, and staff may not be readily available to provide timely service (SISP). | The Project will form farmer extension groups within WUAs. It will promote the use of qualified local NGOs and private firms to provide extension services as appropriate, with support from the consultants. |
| 3. Local Governance Institutions (LGIs) | |
| The involvement of LGI representatives remained minimal, and needs to be enhanced following the 1999 Local Self-Governance Act (SISP). | LGIs will participate in key processes such as sub-project request and SIP agreement. They will also be authorized to implement small schemes on a pilot basis. |
| 4. Water User Associations | |
| WUAs have good track record and capacity to sustain FMIS. More roles may be delegated in implementing subprojects while transforming the roles of line agencies as those of facilitation and technical support (SISP). | WUAs will have increased roles, including endorsement of key decisions, implementation of small civil works, and agriculture extension through the trained in-house extensionists. They will also be trained to represent farmer interests with collective bargaining power. |
| C. Managing Subproject Development Cycle | |
| 1. Subproject Selection and Planning | |
| a. While SISP followed a demand-driven approach, subproject identification was done on an ad hoc basis and without clear strategic guidance (SISP). | a. The Project will define participatory FMIS development strategy at district level to prioritize subprojects having high growth and poverty reduction potentials. |
| b. Project planning should ensure sufficient beneficiary consultation and realistic targets for cropping intensities and yields (BOISN, ERIP, SISP). | a. The Project will provide sufficient time and resources for these processes, with the engagement of private firms, and technical guidance provided by the consultants. |
| c. More thorough environmental impact assessment is needed in terms of water availability (and downstream impacts) and hillside land stability (ISP, ERIP, SISP). | b. The Project will institutionalize (i) preparation of an initial environmental examination for all subprojects, (ii) consultation with downstream water users, and (iii) subsoil investigation in hill areas. |
| 2. Mobilization and Strengthening of WUAs | |
| a. WUA capacities need strengthening in efficient water use, sufficient O&M, and higher agriculture productivity (BOISN, SISP). | a. This will be operated in all subprojects, with the engagement of NGOs and COs. |
| b. WUA strengthening should precede subproject civil work and agriculture programs for the full understanding of improved WUA operations (ISP, RIP SISP). | b. WUA will establish institutional targets in SIP, including membership and beneficiary contribution, and achieve the targets before to initiating civil works. |

Continued on next page

| Lessons Learned from ADB-assisted Projects | Incorporated Lessons Learned |
|--|--|
| <p>3. Irrigation Infrastructure</p> <p>a. Design should promote less capital-intensive structures (BOISN), and reflect the existing O&M practices (RIP). There is a scope to adopt lower-cost design (SISP).</p> <p>b. There were sporadic incidences where quality of construction was low. It was satisfactory where WUAs were actively involved in monitoring of works (SISP).</p> <p>4. Agriculture Development and Livelihood Support</p> <p>a. There was no concerted effort to improve the technological base through a package of support including extension, inputs, credit, and marketing (BOISN, RIP). OFWM should also be improved (SISP).</p> <p>b. There was little mechanism to provide services specifically to the vulnerable groups to enhance their benefits (BOISN, SISP). WUA participation by women and vulnerable groups remained limited (SISP).</p> <p>5. Sustainable O&M</p> <p>WUA commitment, ability, and leadership are essential for effective O&M (BOISN, RIP). Clear O&M plan should be developed before handover (ERIP, RIP). Supervising completed FMIS with annual technical, social, and financial audit should be done (SISP).</p> | <p>a. The Project will improve the design standards by collecting domestic and international experience. WUA engagement in civil works will be increased.</p> <p>b. Quality assurance will be enhanced by (i) sufficient supervision by DOI staff, (ii) construction monitoring by WUAs, and (iii) external technical auditing by NVC.</p> <p>a. (Please see B.1.c. above.) OFWM will also be included as core part of the training programs.</p> <p>b. Programs for the vulnerable groups have been incorporated. The gender dimension is strengthened in (i) WUA membership, (ii) representation in decisions, and (iii) provision of services to target women.</p> <p>WUAs will be trained starting at the inception stage, with the establishment of an O&M plan. Monitoring of all completed FMIS will be institutionalized. WUAs will be trained to effectively undertake postcompletion benefit monitoring and reporting.</p> |
| <p>D. Overall Project Management</p> <p>1. SISP's operational manual provides effective arrangements for developing FMIS. In general, however, compliance at the field level remained an issue (SISP).</p> <p>2. Projects with flexible design and process approach are useful to respond to local needs (BOISN). Too many subprojects implemented in some districts were beyond the existing staff resources (SISP).</p> | <p>1. Operational manual will be revised to include specific performance targets for each stage of subproject cycle, to be monitored through regular SMU-WUA meetings.</p> <p>2. The number of subprojects in each district will be limited following the capacities, performance, and resources. Outsourcing will also be arranged with effective quality control.</p> |
| <p>E. Other Supporting Organizations</p> <p>1. NFIWUAN</p> <p>NFIWUAN is established at national and district levels. They may be able to play effective facilitating roles to support the institutional development of WUAs (SISP).</p> <p>2. NGOs and COs</p> <p>NGOs and COs worked effectively with WUAs in strengthening their institutional basis and agricultural development for pilot schemes. Their capacity needs strengthening at initial stage of engagement (SISP).</p> <p>3. Private Sector Firms and Contractors</p> <p>a. Private sector consulting firms prepared FSR. Sufficient resources should be provided, in particular socio-economic agriculture development plans (SISP).</p> <p>b. Contractors have generally sufficient capacities. Effective monitoring is essential for quality assurance (SISP).</p> | <p>NFIWUAN will be given with appropriate roles under the Project with necessary capacity development support.</p> <p>COs will be engaged in all subprojects in strengthening WUAs. NGOs will be involved, e.g., in prefeasibility screening, CO training, resettlement, and monitoring of completed FMIS, with initial training by the consultants.</p> <p>a. Preparation of FSR will in principle be outsourced to private sector firms. They may also be entrusted for participatory facility designs.</p> <p>b. (Please see C.3.b. for arrangements to ensure quality of construction.)</p> |

CO = community organizer, DOA = Department of Agriculture, DOI = Department of Irrigation, FMIS = farmer managed irrigation system, FSR = feasibility study report, LGI = local governance institution, M&E = monitoring and evaluation, NFIWUAN = National Federation of Irrigation Water User Associations in Nepal, NGO = nongovernment organization, NVC = National Vigilance Center, OFWM = on-farm water management, O&M = operation and maintenance, SIP = subproject implementation plan, SISP = Second Irrigation Sector Project, SMU = subproject management unit, WUA = water user association. Evaluations referred to: BOISN = ADB. 1994. *Impact Evaluation Study on Bank Operations in the Irrigation Sector Nepal*. Manila; ISP = ADB. 1999. *Project Completion Report for Irrigation Sector Project*. Manila; ERIP = ADB. 2002. *Project Performance Audit Report for East Rapti Irrigation Project*. Manila; RIP = ADB. 2003. *Project Completion Report for Rajapur Irrigation Project*. Manila; SISP = Evaluation of the Second Irrigation Sector Project under ADB. 2001. *Technical Assistance to the Kingdom of Nepal for Preparing the Community-Managed Irrigation Sector Project*. Manila.

SECTOR INSTITUTIONAL ANALYSIS

A. Background and Issues

1. The key institutions associated with promoting the development of farmer-managed irrigation systems (FMIS) in Nepal include (i) Department of Irrigation (DOI) under the Ministry of Water Resources, (ii) Department of Agriculture (DOA) under the Ministry of Agriculture and Cooperatives, (iii) local governance institutions (LGI) such as district development committees (DDCs) and village development committees (VDCs), (iv) water user associations (WUAs), and (v) private sector and nongovernment organizations (NGOs). Under the recently completed Second Irrigation Sector Project (SISP), DOI played a lead role in implementation, responsibility for agriculture extension went to DOA, and WUAs acted as recipient of services. The role of LGIs remained nominal, given the relatively recent process of devolution, which was promulgated in the 1999 Local Self-Governance Act (LSGA). Consulting services were used for institutional capacity strengthening, and monitoring and quality control of selected FMIS.

2. **DOI.** DOI is responsible for planning, implementing, and monitoring and evaluating irrigation projects. Under the director general are four technical divisions (planning, design, monitoring and evaluation; surface water irrigation; irrigation management; and groundwater irrigation) at headquarters and five regional irrigation directorates (RID). Under RID are 26 irrigation development divisions (IDDs), 20 irrigation development subdivisions (IDSDs), and 29 unit offices in districts with no IDD or IDSD. Each RID is headed by a class I regional director and has 17–20 professional staff including a socioeconomist and an agriculture officer. IDD (headed by a class II subdivisional engineer) and IDSD (headed by a class III engineer) have about 18–20 and 9–10 professional staff, respectively, including one or two association officers responsible for social mobilization. Overall, DOI has a total of 1,930 posts. About 42% are nonprofessional officers.

3. In FMIS interventions, IDDs/IDSDs are in charge of day-to-day implementation under the supervision of RIDs, while DOI takes on technical backstopping and overall management. At field level, engineering capacities for planning and implementing infrastructure are generally sufficient. However, nonengineering staff and skill are insufficient for WUA social mobilization.¹ There is also a need to operate effective mechanisms to ensure that IDDs/IDSDs (i) undertake sufficient participatory activities in planning and implementation, including the supervision of contractor works; and (ii) coordinate with district agricultural development offices (DADOs) for delivering agriculture programs. RIDs also need to be provided with sufficient resources to properly supervise IDD/IDSD activities. There is a tendency within DOI to take constructing structures as the objective, rather than achieving agriculture production targets by facilitating farmers' efforts.

4. **DOA.** DOA has five regional directorates of agriculture (RDAs) and 75 DADOs in each district. Each DADO has 5–7 agricultural service centers and an additional 5–7 agricultural service subcenters, which provide extension services in the field. DADO is headed by a class I chief officer and has one agriculture development officer (class II) and eight subject matter specialists (class III). DADO delivers specific crop promotion programs that last about 2–3 years in each location. In general, the staff have sufficient technical know-how on modern cropping practices, but their orientation and skills in social activities including forming farmer groups and delivering and effectively disseminating services are generally insufficient. Monitoring also need strengthening to ensure due service delivery to targeted farmers.

¹ IDDs/IDSDs have only 1–2 association officers to cover 2–3 districts. Their incentives (currently ranked in the lowest non-gazetted class) and recognition within the office need upgrading based on performance.

5. **LGIs.** The 1999 LSGA defines the structures, functions, and operating mechanisms of LGIs. The LSGA stipulates that DDCs will take over district-level development activities of line agencies by setting up sectoral units to work under DDC supervision (with the line agencies to take on regulatory functions, technical backstopping, and macrolevel sectoral programming). Following the Decentralization Implementation Action Plan (DIAP) in January 2002, DADOs were placed under the supervision of the concerned DDCs, although DDCs have been playing only nominal roles to date.² Decisions have also been made to establish district technical offices (DTOs) to cover rural roads, small-scale irrigation, rural water supply, and other district infrastructure. Yet approved DTO staff members are still limited to 7–10 in each district and are mostly seconded personnel from the Department of Local Infrastructure Development and Agriculture Roads (DOLIDAR), and some 300 posts are vacant.

6. **Private Sector Organizations.** Government technical staffs generally lack skills to handle social preparation activities such as group formation and participatory interventions. On the other hand, private sector providers including NGOs and community organizers (COs) are effective in facilitating group processes involving target groups such as women and poor households in a number of development works. There are also NGOs and private sector agents providing agriculture extension services. In the irrigation subsector, DOI engages private consultants for feasibility studies, designs and construction supervision; however, service quality is not necessarily up to standard and calls for adoption of more upgraded and low-cost technology effectively integrated with agriculture and social planning. In general, NGOs, COs, and other private sector agents, particularly those locally based, may not have the required skills, but their capacity can be built through training from national-level NGOs and consultants.

7. **WUAs.** WUAs are informal farmer irrigator groups that have evolved over generations, since constructing irrigation facilities by mobilizing their own resources. Typical groups regularly elect leaders, hold meetings, and have working rules and water-sharing arrangements. They have a proven track record of sustained operation and maintenance (O&M), and have the capacity to do the same for the renovated FMIS. As farmers, they are also interested in getting essential inputs and necessary extension services. While WUAs are registered in DDCs when FMIS assistance is provided, most remain routine maintenance agents only, and some tend to be less active where O&M requirements declined after structure improvement. There is scope for sufficiently training them so that they can effectively liaise with input providers and marketing agents with collective bargaining power. Their capacity also needs strengthening to meet the interests of the poor and vulnerable groups such as women.³

B. Institutional Arrangements and Strengthening under the Project

8. The Government's poverty reduction strategy and the 10th Five-Year Plan (2003–2007) have emphasized rural-oriented poverty reduction with improved service provision and governance through stronger agency coordination, community participation, private sector and NGO engagement, and decentralization. The institutional arrangements of the Project will follow these principles in promoting effective FMIS renovation. Necessary policy and institutional actions will also be pursued. Consulting services for institutional strengthening and project management (ISPM) are provided to implement the improved arrangements.

² There are no elected representatives in LGIs since 2002 after expiration of the terms of the elected officials and cancellation of new elections. While DDCs have delegated authorities for district-level planning, implementation, and expenditure, they are passed on to DADOs that continue to operate with linkage to the RDAs and DOA.

³ WUA federations have also been formed at the national level and in some districts with international NGO assistance. These federations take on active roles in information dissemination and WUA training, and as a lobby to monitor and promote effective FMIS program operations.

9. **Field-Level Implementation.** Existing public organizations have institutional constraints in staff resources, skills, and arrangements for (i) agency coordination, (ii) WUA social mobilization, (iii) participatory service provision, and (iv) monitoring and quality control. The arrangements envisage implementation to be driven by the interest to improve FMIS agriculture productivity as opposed to constructing structures, while transforming public agencies from implementers to genuine facilitators. Specific measures include the following:

- (i) **Coordination.** In each district, a subproject management unit (SMU) will be formed with the assigned staff of IDD/IDSD, DADO, and DDC, to plan and supervise the implementation of subprojects.⁴ At the outset, the SMU will prepare a concise but comprehensive subproject implementation plan (SIP) that specifies individual programs including their schedules, institutional responsibilities, and output targets.⁵ The SMU will engage private firms to prepare SIPs using inputs provided by specialists (in IDD/IDSD and DADO) that the SMU designates as available, and through a consultative process.
- (ii) **WUA social mobilization.** Activities following the work plan in SIP will be facilitated by local community organizers (COs) engaged by the SMU. Local NGOs will be engaged to train and support the COs. WUA federations at the national and district levels will be engaged to take on the NGO roles as appropriate, with capacity development support. Building on their routine O&M roles, WUAs will also be trained to facilitate delivery of agriculture inputs and services to drive the local agriculture development process.
- (iii) **Participatory implementation.** Services are provided following the SIP and subproject work plans prepared by SMU. To ensure participatory processes, WUAs will endorse the SIP and periodic work plans including detailed design. For irrigation works, WUAs will implement simple structures with technical support by IDD/IDSD staff, and will be trained to monitor contractor works for complex structures. For agriculture and other programs, private sector or NGOs will be engaged to address constraints in DADO and IDD/IDSD.
- (iv) **Monitoring and quality control.** The SMU will regularly hold progress review meetings, inviting WUAs that monitor the delivered services. For quality control purposes, the regional project support unit (RPSU) will field mobile teams including ISPM consultants to verify the key field outputs such as SIP. RPSU will also monitor SMU operation through regular management review (with SMU staff) and office inspection.⁶ Along with these, an external technical audit will be undertaken through the National Vigilance Center.

10. **LGI Roles and Capacity Strengthening.** Institutional arrangements for the Project will strengthen the roles and capacities of LGIs in particular DDCs to implement the LSGA. Specifically, DDCs will (i) arrange information campaigns to its members and WUAs, (ii) screen and submit WUA subproject requests to the SMU, (iii) participate in preparing the SIP and periodical work plans, and (iv) include those plans in the district development plans and annual plans. Steps are also taken to progressively devolve small-scale FMIS interventions to DDCs that have formed viable irrigation implementation teams with the support and supervision of the SMU and capacity development support provided by ISPM consultants (para. 38, main text). Services such as agriculture extension, which were devolved to DDCs, will be provided through

⁴ This follows the arrangements proven effective in other ADB-assisted projects for livestock development and community-groundwater development.

⁵ This will include specific arrangements for the delivery of non-Project assisted services such as fertilizer and certain varieties of improved seeds.

⁶ This will ensure that subprojects taken up in the SMU are in line with their absorptive capacity, and in accordance with the stipulated procedures.

subject matter offices in DDC such as DADO (which engages private sector agents and NGOs), but DDCs will exercise their due authority under the DIAP to program and execute the services. The ISPM consultants will provide capacity development support to DDCs and DTOs by providing orientation and on-the-job training for the specific responsibilities. District-level institutional arrangements will further be assessed and refined during project implementation to further advance the Government's devolution programs.

11. **National-Level Policy and Institutional Development.** The Project will support national-level policy and institutional improvement for operating improved FMIS renovation mechanisms. Specifically, the Project will advise on the ongoing reforms in water resources and agriculture, and assist in practical actions to improve FMIS development operations within DOI. Specific actions are given in Appendix 5.

C. Impacts of Conflicts and Coping Measures

12. The ongoing insurgency poses a sizable risk that may delay project implementation. It is not possible to predict the location and timing of conflicts, and the type of violence and insecurity. There are also uncertainties regarding the attitudes of the insurgents although development activities to enhance the livelihood of the local population, particularly the poor, are generally supported and implemented in conflict-affected areas with the assistance of several aid agencies. Improving community-based irrigation infrastructure falls under this category, where they are managed and driven by WUAs with genuine local interest.

13. Under insecure conditions, some Government and LGI staff may face security risks as they may be seen as representing security forces. They often are reluctant to travel away from district headquarters. Movement of Government vehicles is also restricted, since they are often subject to attack. The impacts can be mitigated by engaging persons who can work safely under such environment, e.g., locally accepted NGOs and private service providers, in lieu of the concerned Government/LGI staff for field-level implementation activities. However, subproject planning and quality control activities may still be affected, as they need more competent technical and social capacities limited to central based NGOs and consultants, who are more vulnerable under conditions that lack security.⁷

14. To cope with the insurgency, the project design allows flexible subproject selection following local conditions. It also envisages taking an approach that has proven effective in conflict environments, i.e., community-driven and transparent approach that holds project institutions accountable to local communities. The Project will initially operate in areas with a more secure environment; it will focus on staff training and progressively establish a model that could operate under conflict situations, while duly incorporating measures effective in conflict environments, such as (i) intensive security monitoring, (ii) training project staff to work in conflict situations, and (iii) building strong trust in the project staff through close communication with the local communities. Should serious conflicts arise in any area, the Project will apply a flexible approach by modifying the implementation arrangements and engaging local NGOs and private service providers in lieu of affected Government or LGI staff, and pursue appropriate alternative measures to implement activities beyond the capacities of these local NGOs and consultants,⁸ in consultation with the concerned community. On the basis of initial experience, the Project intends to expand the areas of operation in more conflict-affected areas.

⁷ The Government and centrally based consultants undertook preparatory fieldwork with the support of the local WUA representatives under the presence of some insurgents (in areas under UN security phase 3).

⁸ Examples include (i) strengthening the capacity of local NGOs and private providers, (ii) taking up smaller and straightforward schemes, and (iii) establishing an environment where central-based agents can provide services.

POLICY AND INSTITUTIONAL REFORMS AND IMPLEMENTATION MATRIX

| Key Issues and Actions | Action by | Agreed Action Date |
|--|--|---|
| <p>1. Overall Issues for Irrigated Agriculture Development</p> <p>a. Agriculture Policy Maintain regular dialogues with the ADB to follow up on the reform measures initiated in the 2nd Agriculture Sector Program Loan, and 2002 Agriculture Sector Performance Review.</p> <p>b. Irrigated Agriculture Development Strategy Prepare district/river basin-based irrigated agriculture development strategy in Central and Eastern regions, which include ongoing programs, marketing opportunities, and irrigation scheme inventory, to guide strategic subproject identification and selection.</p> | <p>DOA, MOAC</p> <p>DOA, DOI, WECS</p> | <p>Ongoing. The review missions of the Project will review and consult on the progress</p> <p>Within 1 year after fielding of ISPM consultants</p> |
| <p>2. Policy and Strategic Framework of Water Resources Management</p> <p>a. NWRS was finalized. It defined short- to long-term institutional and physical targets and actions with IWRM approach.</p> <p>b. Prepare IWRM policy to set out objectives, principles, and institutional framework to manage the development and utilization of water resources.</p> <p>c. Define the scope of revising Water Resources Act and its Regulations to operate the IWRM policy.</p> <p>d. In the context of the above, define appropriate institutional framework to operate IWRM at national and river basin levels.</p> <p>e. Prepare long-term national water plan that lays out programs to achieve the targets of NWRS.</p> | <p>WECS, concerned ministries and agencies</p> <p>Same as above</p> <p>Same as above</p> <p>Same as above</p> <p>Same as above</p> | <p>Completed</p> <p>By June 2005</p> <p>By June 2005</p> <p>By June 2005</p> <p>By June 2005</p> |
| <p>3. Policy, Planning, and Legal Framework of Irrigation</p> <p>a. Irrigation policy was revised incorporating NWRS principles of river basin planning, integration with agriculture, and social equity and gender perspectives. Policy will be further revised based on the experience of the proposed Project.</p> <p>b. Irrigation Regulation was revised to reflect the new irrigation policy while empowering agencies and WUAs in local resource mobilization and system management.</p> <p>c. Prepare 25-year irrigation investment plan building on the Agriculture Perspective Plan and NWRS. Draft submitted to ADB for review and consultation.</p> <p>d. Prepare and launch, following the 10th FYP commitment, action plans for the enhancement of people's participation and WUA efficiency.</p> | <p>DOI, WECS, DOA</p> <p>DOI</p> <p>DOI, DOA</p> <p>DOI</p> | <p>Drafted with PPTA contribution and finalized in 2003 Further updating/revision of the Policy in 2008</p> <p>Revised following the 2003 Irrigation Policy in early 2004 Further updating/ revision in 2009.</p> <p>By June 2005</p> <p>By June 2005</p> |

Continued on next page

| Key Issues and Actions | Action by | Agreed Action Date |
|---|---|--|
| e. Prepare policy and guidelines for non-conventional minor irrigation, including financing modality and institutional arrangements, in consultation with stakeholders. | DOI | By MTR |
| <p>4. Institutions of Department of Irrigation DOI to form internal working groups and address the following issues, and with advisory support through CMIASP consultancy.</p> <p>a. Organizational Vision and Strategy Prepare organizational vision for the future, goals and objectives, and strategy, on the basis of NWRS and revised irrigation policy principles and strategy.</p> <p>b. Decentralization</p> <p>(i) Start assisting the reasonable number of DDCs to prepare and implement small FMIS by forming effective irrigation implementation teams with assistance from DOI.</p> <p>(ii) Define appropriate road map and action plan to decentralize DOI's overall operations to LGIs.</p> <p>c. Human Resources Management</p> <p>(i) Prepare action plan to further rationalize the staff resources and improve the multidisciplinary capacities of DOI including appropriate skill mix in line with the vision and strategy, and rules for recruitment, promotion, and job rotation.</p> <p>(ii) Provide improved incentives to association organizers by giving promotional opportunities to senior positions having non-gazetted first class rank.</p> <p>(iii) Review and update staff capacity development plan comprehensively including technical and non-technical aspects.</p> <p>d. Financial Resources Management</p> <p>(i) Operate performance-based budgetary allocation mechanism in the context of CMIASP.</p> <p>(ii) Establish and operate regular monitoring and auditing of completed WUA and scheme performance.</p> <p>(iii) Government budget provision system and guidelines to support the rehabilitation of completed schemes (suffering from catastrophic damages beyond design return period).</p> | <p>DOI, MOWR</p> <p>DOI</p> <p>DOI, MOWR, MOLD, DDCs, VDCs</p> <p>DOI, MOWR, MOLD</p> <p>DOI, MOWR</p> <p>DOI, (MOGA, MOF)</p> <p>DOI, MOWR</p> <p>DOI</p> <p>DOI</p> <p>DOI, MOF</p> | <p>Working group for key issues formed immediately and start activities</p> <p>Preliminary framework was discussed at appraisal and was submitted in Aug 2004 Vision and strategy document prepared within 1 year after loan effectiveness</p> <p>Within 2 years after loan effectiveness, performance to be reviewed at MTR By MTR, after which implementation starts</p> <p>By MTR, after which implementation starts</p> <p>Within 2 years after loan effectiveness, after AO capacity development</p> <p>Action plan formulated by MTR, and implemented by loan closing</p> <p>Immediately after loan effectiveness</p> <p>Immediately after loan effectiveness</p> <p>By loan closing (CMIASP support to be phased out)</p> |

Continued on next page

| Key Issues and Actions | Action by | Agreed Action Date |
|---|---|--|
| <p>e. FMIS Guidelines and Manuals</p> <p>(i) Prepare design standards and manuals for small-scale and simple structures applicable to FMIS.</p> <p>(ii) Improve selection and planning standards for the hills and the mountains.</p> <p>(iii) Improve construction management guidelines ensuring stringent qualification, bidding, contract signing, variation and budgetary management, and improved supervision guidelines in terms of testing of sample materials, measurement and recording of quantities, and tests on completion.</p> <p>(iv) Revise the operational procedural manual for FMIS interventions following the CMIASP design.</p> <p>f. Internal Quality Control Mechanism</p> <p>(i) Operate and regularly refine the internal quality control mechanisms defined under CMIASP, comprising quality assurance with the expert staff, and office inspection systems.</p> <p>(ii) Review and prepare an action plan to improve the overall internal quality control systems of DOI, including rules on delegation of financial and administrative power.</p> | <p>DOI</p> <p>DOI</p> <p>DOI</p> <p>DOI, DOA</p> <p>DOI</p> <p>DOI, MOWR</p> | <p>Within 1 year after fielding of ISPM consultants</p> <p>Same as above</p> <p>Same as above</p> <p>Within 6 months of effectiveness</p> <p>Within 6 months after fielding of ISPM consultants</p> <p>By 4 years after loan effectiveness</p> |
| <p>5. External Quality Control/Technical Audit</p> <p>a. A decision has been made to establish and operate the technical audit office under the National Vigilance Center.</p> <p>b. Finalize institutional modality, operational procedures, and arrangements for operating technical audit functions at large.</p> <p>c. Initiate operation of external technical audit in selected subprojects under the Project and rural infrastructure projects.</p> | <p>NVC</p> <p>NVC, concerned ministries and agencies</p> <p>NVC, DOI, MOWR, DOLIDAR, MOLD</p> | <p>Completed.</p> <p>By June 2005</p> <p>By December 2005</p> |

AO = association officer, CMIASP = Community-Managed Irrigated Agriculture Sector Project, DDC = district development committee, DOA = Department of Agriculture, DOI = Department of Irrigation, DOLIDAR = Department of Local Infrastructure Development and Agriculture Roads, FMIS = farmer-managed irrigation systems, FYP = five-year plan, ISPM = institutional strengthening and project management, IWRM = integrated water resources management, LGI = local governance institution, MOAC = Ministry of Agriculture and Cooperatives, MOF = Ministry of Finance, MOGA = Ministry of General Administration, MOLD = Ministry of Local Development, MOWR = Ministry of Water Resources, MTR = midterm review, NVC = National Vigilance Committee, NWRS = National Water Resources Strategy, PPTA = project preparatory technical assistance, VDC = village development committee, WECS = Water and Energy Commission Secretariat, WUA = water user association.

COST ESTIMATES AND FINANCING PLAN

Table A6.1: Project Cost Summary

| Item | (N. Rupee '000) | | | (\$ '000) | | | (%) | (%) |
|--|------------------|----------------|------------------|---------------|---------------|---------------|------------------|------------|
| | Local | Foreign | Total | Local | Foreign | Total | Foreign Exchange | Base Costs |
| A. Participatory Irrigated Agriculture Development for FMIS | | | | | | | | |
| 1. Participatory Planning and Beneficiary Mobilization | 205,200 | 46,800 | 252,000 | 2,665 | 608 | 3,273 | 19 | 10 |
| 2. Irrigation and Associated Infrastructure | 1,104,200 | 666,500 | 1,770,700 | 14,340 | 8,656 | 22,996 | 38 | 68 |
| 3. Agricultural Development and Livelihood Enhancement | 193,700 | 38,400 | 232,200 | 2,516 | 499 | 3,015 | 17 | 9 |
| 4. Support for Sustainable Operation and Maintenance | 47,700 | 7,400 | 55,100 | 619 | 97 | 716 | 13 | 2 |
| Subtotal | 1,550,800 | 759,200 | 2,310,000 | 20,140 | 9,859 | 30,000 | 33 | 88 |
| B. Institutional Strengthening and Project Management | 218,100 | 91,000 | 309,100 | 2,832 | 1,182 | 4,015 | 29 | 12 |
| Total Base Cost | 1,768,900 | 850,200 | 2,619,100 | 22,973 | 11,042 | 34,015 | 32 | 100 |
| Physical Contingencies | 28,900 | 4,300 | 33,300 | 376 | 56 | 432 | 13 | 1 |
| Price Contingencies | 191,000 | 54,300 | 245,300 | 2,480 | 706 | 3,186 | 22 | 9 |
| Total Baseline Cost | 1,988,800 | 908,900 | 2,897,700 | 25,829 | 11,804 | 37,633 | 31 | 111 |
| Interest Charge | 0 | 73,400 | 73,400 | 0 | 953 | 953 | 100 | 3 |
| Total Project Cost | 1,988,800 | 982,200 | 2,971,100 | 25,829 | 12,756 | 38,585 | 33 | 113 |

Source: Asian Development Bank Estimates.

Table A6.2: Expenditure Accounts by Financiers (\$'000)

| Item | Government | | ADB | | OPEC Fund | | Farmers | | Total | | Foreign | Duties & |
|--|--------------|-------------|---------------|-------------|--------------|-------------|--------------|------------|---------------|--------------|---------------|--------------|
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) | Exchange | Taxes |
| 1. Civil Works | 6,853 | 28.0 | 8,412 | 34.4 | 7,000 | 28.6 | 2,192 | 9.0 | 24,457 | 63.4 | 9,154 | 3,657 |
| 2. Vehicles and Equipment | 471 | 23.8 | 1,505 | 76.2 | 0 | 0.0 | 0 | 0.0 | 1,976 | 5.1 | 706 | 383 |
| 3. Specialist Services | 495 | 15.0 | 2,804 | 85.0 | 0 | 0.0 | 0 | 0.0 | 3,299 | 8.6 | 1,408 | 495 |
| 4. Training | 431 | 18.6 | 1,884 | 81.4 | 0 | 0.0 | 0 | 0.0 | 2,315 | 6.0 | 174 | 322 |
| 5. Community Organizers | 0 | 0.0 | 355 | 100.0 | 0 | 0.0 | 0 | 0.0 | 355 | 0.9 | 0 | 0 |
| 6. Incremental Operating Cost | 232 | 15.0 | 1,315 | 85.0 | 0 | 0.0 | 0 | 0.0 | 1,547 | 4.0 | 20 | 232 |
| 7. Survey and Investigation | 408 | 16.3 | 2,097 | 83.7 | 0 | 0.0 | 0 | 0.0 | 2,506 | 6.5 | 129 | 278 |
| 8. Monitoring and Evaluation | 114 | 15.0 | 643 | 85.0 | 0 | 0.0 | 0 | 0.0 | 757 | 2.0 | 124 | 114 |
| 9. Research | 17 | 5.9 | 268 | 94.1 | 0 | 0.0 | 0 | 0.0 | 285 | 0.7 | 22 | 17 |
| 10. Vehicle and Equipment O&M | 41 | 29.7 | 96 | 70.3 | 0 | 0.0 | 0 | 0.0 | 136 | 0.4 | 67 | 27 |
| Total Baseline Cost^a | 9,060 | 24.1 | 19,380 | 51.5 | 7,000 | 18.6 | 2,192 | 5.8 | 37,633 | 97.5 | 11,804 | 5,525 |
| Interest Charge ^b | 333 | 34.9 | 620 | 65.1 | 0 | 0.0 | 0 | 0.0 | 953 | 2.5 | 953 | 0 |
| Total Project Cost | 9,393 | 24.3 | 20,000 | 51.8 | 7,000 | 18.1 | 2,192 | 5.7 | 38,585 | 100.0 | 12,756 | 5,525 |

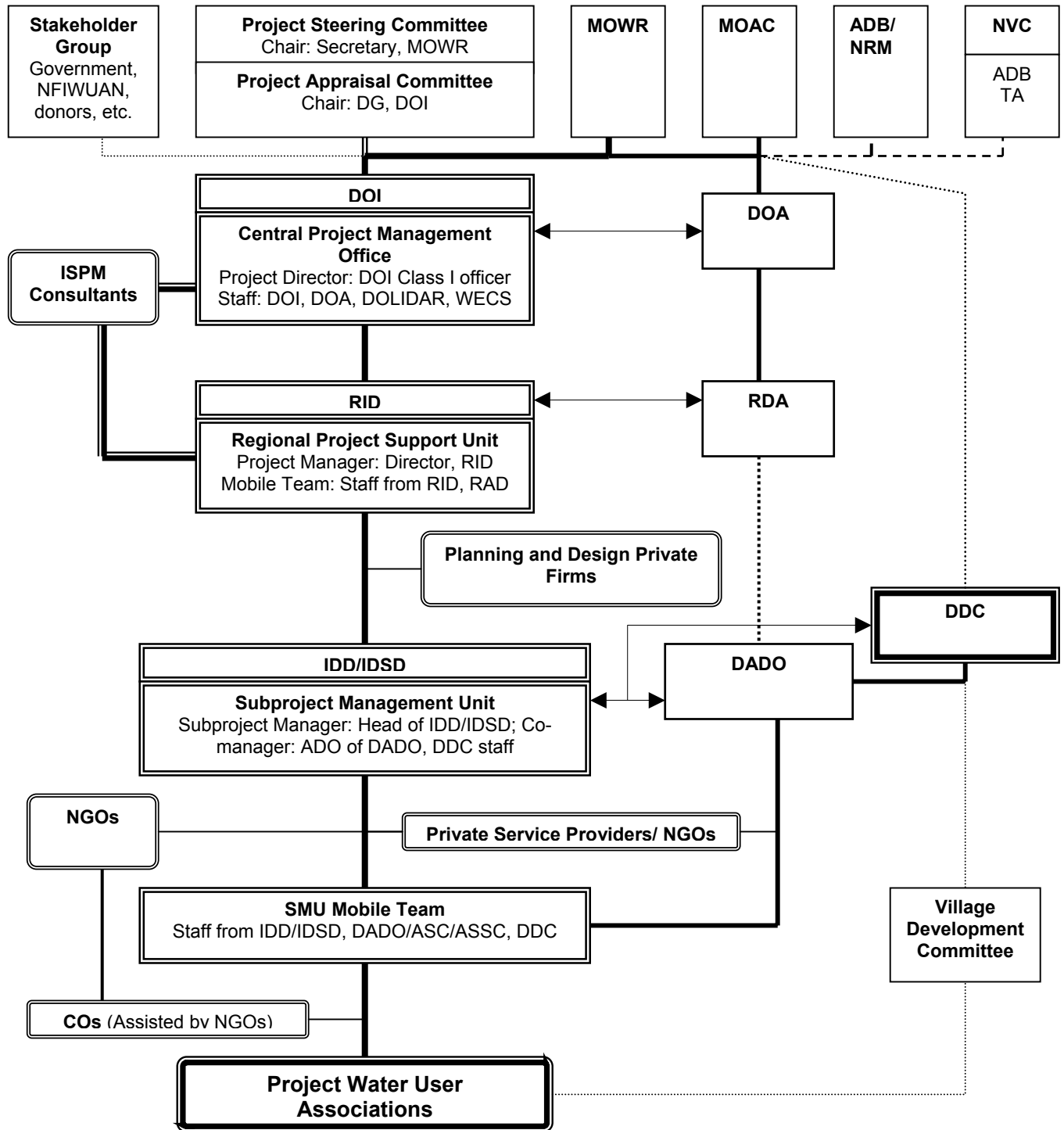
ADB = Asian Development Bank, O&M = operation and maintenance, OPEC Fund = Organization of Petroleum Exporting Countries Fund for International Development

^a Including \$600,000 for environmental planning and mitigation management activities.

^b The Government contribution corresponds to interest during construction associated with OPEC Fund loan.

Source: ADB estimates.

ORGANIZATION CHART



ADB = Asian Development Bank, ADO = agriculture development officer, ASC/ASSC = agriculture service center/sub-center, CO = community organizer, DADO = district agriculture development office, DDC = district development committee, DG = director general, DOA = Department of Agriculture, DOI = Department of Irrigation, DOLIDAR = Department of Local Infrastructure Development and Agriculture Roads, IDD/ISDS = Irrigation Development Division/Subdivision, ISPM = institutional strengthening and project management, MOAC = Ministry of Agriculture and Cooperatives, MOWR = Ministry of Water Resources, NFIWUAN = National Federation of Irrigation Water User Associations Nepal, NGO = nongovernment organization, NRM = Nepal Resident Mission, NVC = National Vigilance Center, RDA = Regional Directorate of Agriculture, RID = Regional Irrigation Directorate, SMU = subproject management unit, TA = technical assistance, WECS = Water and Energy Commission Secretariat.

SUBPROJECT SELECTION CRITERIA

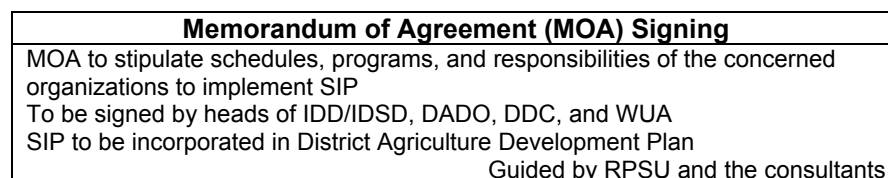
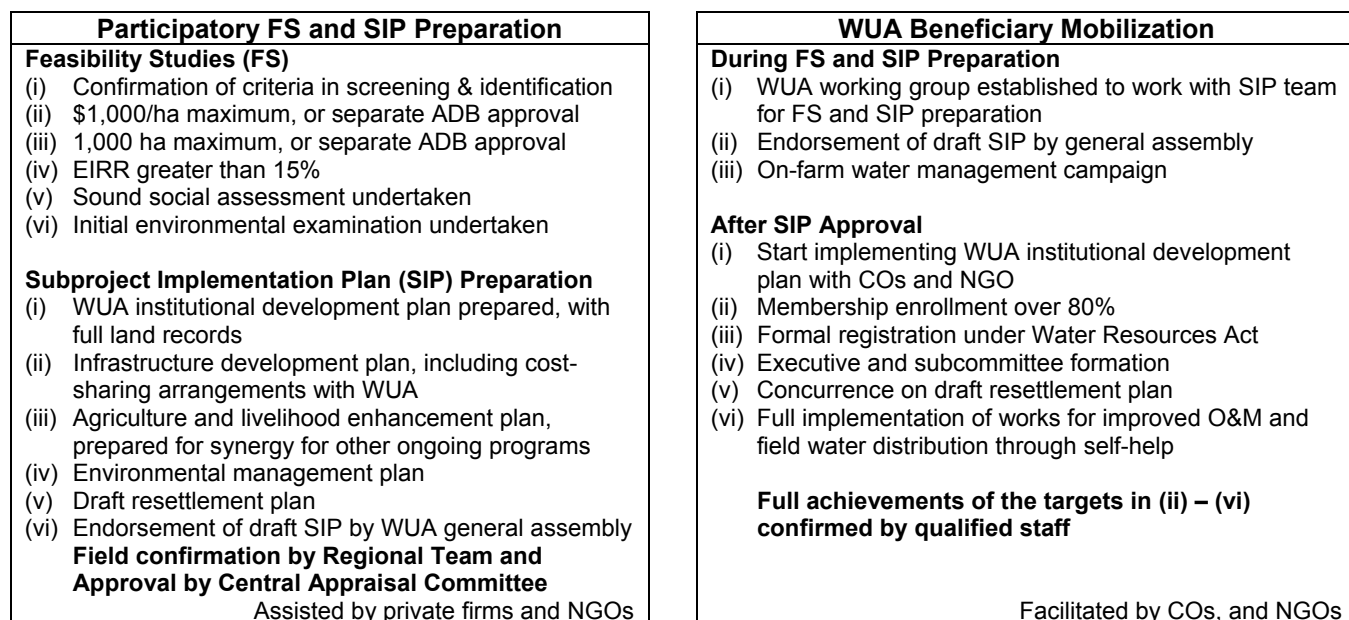
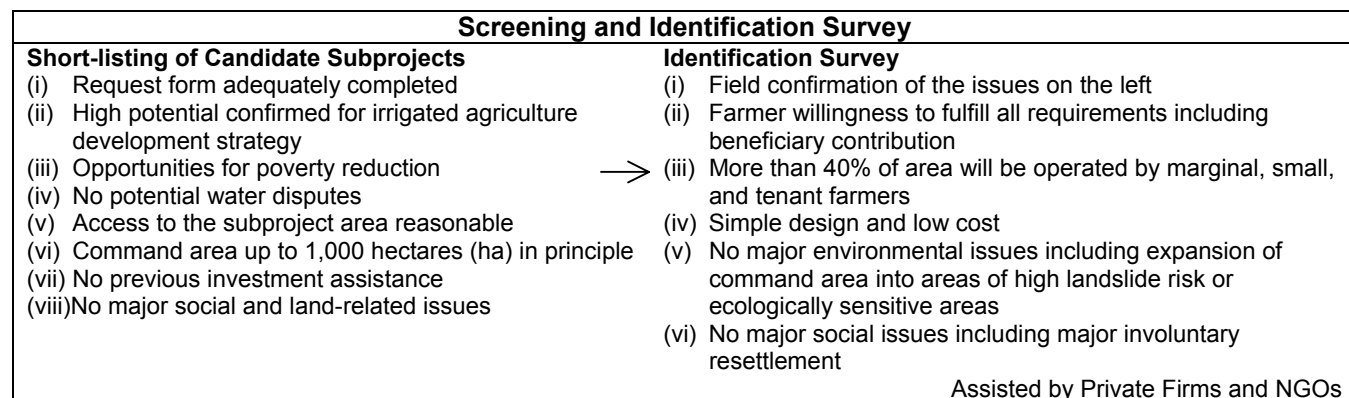
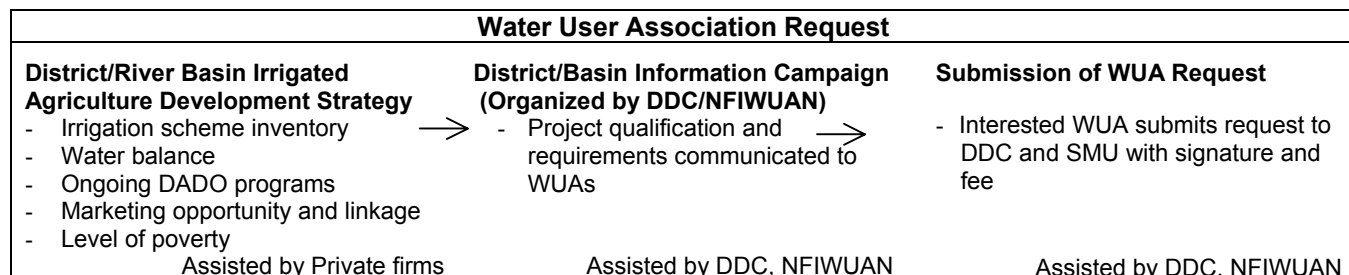
The subproject selection criteria are as follows:

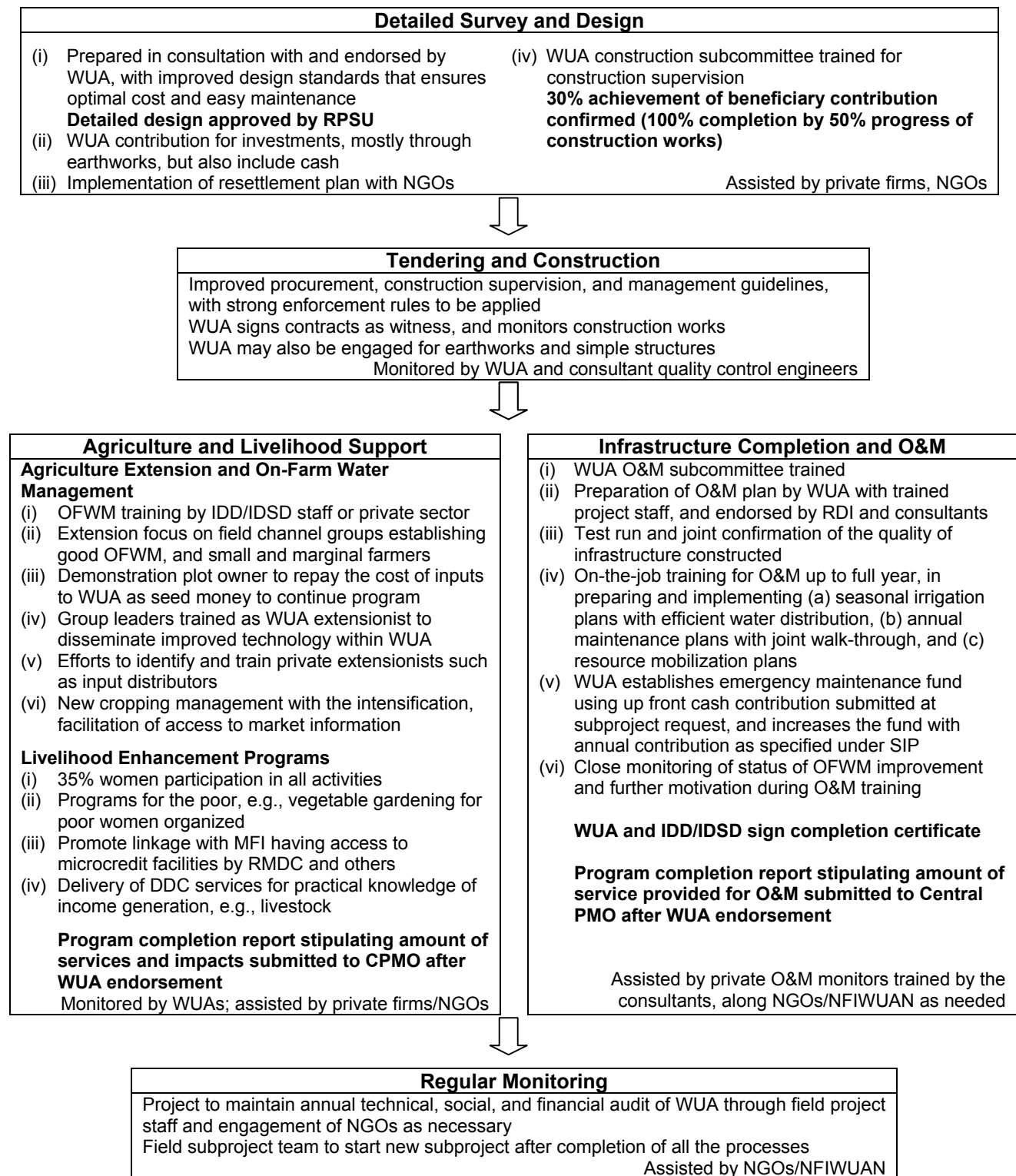
- (i) The subproject must be in line with the district/basin irrigated agriculture development strategy, i.e., have good marketing opportunities for intensified/diversified agriculture, and access to agriculture support services such as extension. Those having prospects for promoting year-round irrigation will be accorded high priority.
- (ii) The subproject area has relatively equal land distribution, i.e., more than 40% of the benefit area is operated by marginal and small farmers (up to 0.5 hectares (ha) holdings in the hills and 1.0 ha in the terai), or by the smallest 70% of the beneficiary households. Preference will be given to subprojects with higher percentages of land operated by these farmers and to subprojects located in food-deficit areas.
- (iii) The subproject will have more than 50 beneficiary households¹ and is not larger than 1,000 ha, unless otherwise concurred in by the Asian Development Bank (ADB).²
- (iv) The subproject cost must not exceed \$1,000/ha, unless otherwise concurred in by ADB.
- (v) The farmers must have established a water user association (WUA) that has been operating and maintaining the concerned farmer-managed irrigation systems (FMIS) as confirmed by annual resource mobilization for operation and maintenance (O&M) (through labor and cash contribution) and absence of intra-WUA conflicts. The farmers are willing to mobilize and contribute resources (labor, cash, or in kind) to implement the subproject, as demonstrated by more than 70% of the beneficiary households having signed off on the subproject request with assured beneficiary contribution.
- (vi) The concerned WUA has provided up-front cash contribution of at least NRs50 per hectare of its command area, established the emergency fund for nonrecurrent O&M works with the said contribution, and agreed and increased it annually by contributing an additional amount to be specified in the subproject implementation plan, but not less than 0.5% of the subproject rehabilitation cost.
- (vii) The subproject will not have any major negative environmental impacts that require environmental impact assessment study, including any negative impact on other users of the same source. Initial environmental examination has been undertaken and approved after consulting the beneficiaries and those affected by the project, concluding that the subproject is environmentally sound and any negative consequences can be mitigated.
- (viii) The subproject will not involve any land acquisition or involuntary resettlement, or both. In the event that land acquisition or resettlement, or both are required for any subproject, resettlement plans will be prepared and implemented following the agreed-upon resettlement framework (Appendix 16) before initiating the tendering of the civil works.
- (ix) The subproject must be technically feasible, financially and economically viable with economic internal rate of return of at least 15% (except as agreed by ADB but not less than 12%), and socially sound, requiring no or minimal involuntary resettlement.
- (x) The subproject will not have any previous experience of major investment or rehabilitation supported by the Government, external funding agencies, or nongovernment organizations within the last 15 years.

¹ Except for demonstration activities for innovative small-scale minor irrigation for the poorest.

² The Department of Irrigation (DOI) will submit the subproject implementation plan (SIP) to ADB for schemes larger than 250 ha in the hills and 500 ha in the terai for information.

SUBPROJECT IMPLEMENTATION PROCEDURE





ADB = Asian Development Bank, CO = community organizer, CPMO = central project management office, DADO = district agriculture development office, DDC = district development committee, EIRR = economic internal rate of return, FS = feasibility study, IDD/IDSD = Irrigation Development Division/Subdivision, MFI = microfinance Institution, MOA = memorandum of understanding, NGO = nongovernment organization, NFIWUAN = National Federation of Irrigation Water User Associations Nepal, O&M = operation and maintenance, OFWM = on-farm water management; RID = Regional irrigation directorate, RMDC = Rural Microfinance Development Center, RPSU = regional project support unit, SIP = subproject implementation plan, SMU = subproject management unit, WUA = water user association.

IMPLEMENTATION SCHEDULE

| Component | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 |
|--|--------|--------|--------|--------|--------|--------|--------|
| A. Participatory Irrigated Agriculture Development for FMIS | | | | | | | |
| 1. Participatory Planning and Beneficiary Mobilization | | | | | | | |
| Batch 1 (10 districts in 2 clusters) | █ | | | | | | |
| Batch 2 (20 districts in 4 clusters) | | █ | | | | | |
| Batch 3 (25 districts in 5 clusters) | | | █ | | | | |
| Batch 4 (25 districts in 5 clusters) | | | | █ | | | |
| Batch 5 (35 districts in 7 clusters) | | | | | █ | | |
| 2. Irrigation and Associated Infrastructure | | | | | | | |
| Batch 1 (10 districts in 2 clusters) | | █ | | | | | |
| Batch 2 (20 districts in 4 clusters) | | | █ | | | | |
| Batch 3 (25 districts in 5 clusters) | | | | █ | | | |
| Batch 4 (25 districts in 5 clusters) | | | | | █ | | |
| Batch 5 (35 districts in 7 clusters) | | | | | | █ | |
| 3. Agriculture Development and Livelihood Enhancement | | | | | | | |
| Batch 1 (10 districts in 2 clusters) | █ | | | | | | |
| Batch 2 (20 districts in 4 clusters) | | █ | | | | | |
| Batch 3 (25 districts in 5 clusters) | | | █ | | | | |
| Batch 4 (25 districts in 5 clusters) | | | | █ | | | |
| Batch 5 (35 districts in 7 clusters) | | | | | | █ | |
| Innovative Irrigation for the Poorest | █ | █ | █ | █ | █ | █ | █ |
| 4. Support for Sustainable O&M of FMIS | | | | | | | |
| - Disaster Rehabilitation | | | | █ | █ | █ | █ |
| - Monitoring and Technical Advice | █ | █ | █ | █ | █ | █ | █ |
| B. Institutional Strengthening and Project Management | | | | | | | |
| 1. Support for National Level Strengthening | █ | █ | █ | █ | █ | █ | █ |
| 2. Operation of FMIS Intervention Mechanisms | █ | █ | █ | █ | █ | █ | █ |
| 3. Training | █ | █ | █ | █ | █ | █ | █ |

FMIS= farmer-managed irrigated agriculture system, O&M = operation and maintenance.

INDICATIVE CONTRACT PACKAGES

| Item | Estimated Total Cost (\$ million) | Number of Packages | Mode of Procurement |
|--|---|-----------------------|------------------------|
| 1. Civil Works | | | |
| Irrigation and Associated Infrastructure | 24.5 | 500 | LCB |
| 2. Equipment and Vehicles | | | |
| a. Vehicles | 0.1 | 1 | IS |
| b. Vehicles Spare Parts and Maintenance | 0.2 | 50 | LCB/ DP |
| c. Equipment and Supplies | 1.7 | Multiple | LCB/ DP |
| Subtotal | 2.0 | | |
| 3. Services | | | |
| a. Consulting Services | 3.3 | 1 | |
| b. Surveys and Studies | 2.0 | 50 | |
| c. NGO Services ^a | 0.7 | 105 | |
| Subtotal | 6.0 | | |
| Total Contracts | 32.5 | | |

IS = international shopping, LCB = local competitive bidding, NGO = nongovernment organization.

^a National Federation of Irrigation Water User Associations Nepal may be directly engaged for a small number of selected districts to undertake awareness and social mobilization of water user associations with capacity development provided through the consultants.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTING SERVICES

1. Over the 7-year project implementation period, a team providing 55 person-months of international and 519 person-months of domestic consulting services will be required (Table A12).

Table A12: Summary of Consulting Services

| Expertise | Person-months | |
|--|---------------|------------|
| | International | Domestic |
| Central Project Management Office | | |
| Irrigation and Water Management Specialist–Team Leader | 27 | |
| Irrigation Specialist–Deputy Team Leader | | 72 |
| Participatory Development Specialists | 12 | 32 |
| Water Resources Design Engineer | 8 | |
| Minor Irrigation Specialist | | 36 |
| Agriculture Development Planners | 8 | 12 |
| Gender and Poverty Specialist | | 24 |
| Environmental Specialist | | 22 |
| Financial Management and Accounting Specialist | | 22 |
| Regional Project Support Unit | | |
| Irrigation Planning and Design Engineers (2) | | 45 |
| Construction Quality Control Engineers (2) | | 84 |
| Agriculture and Extension Specialists (2) | | 48 |
| Agriculture Economists (2) | | 26 |
| Livelihood Enhancement Specialists (2) | | 48 |
| Resettlement Specialists (2) | | 48 |
| Total | 55 | 519 |

Source: ADB estimates.

A. Central Project Management Office

2. **Irrigation and Water Management Specialist–Team Leader** (international). The team leader (TL) will provide overall guidance for all activities of the consultants' team, and will (i) assist in setting up, operating, and modifying as appropriate project management systems that will ensure delivery of quality service and backup to regional and field units while preparing work plans and progress reports; (ii) assist in outsourcing services to nongovernment organizations (NGOs) and private agents; (iii) review and advise on key outputs such as district irrigated agriculture development strategy and subproject implementation plans (SIPs); (iv) prepare training programs for project institutions, NGOs, and the private sector; (v) assist the Department of Irrigation (DOI) in devolving responsibilities to local governance institutions (LGIs); (vi) coordinate project activities with the concerned agencies and other development projects in the sector; and (vii) review and advise on the progress of policy and institutional actions shown in Appendix 5.

3. **Irrigation Specialist–Deputy Team Leader** (domestic). The deputy team leader will (i) assist the TL in all aspects of project planning and implementation, (ii) act on behalf of the TL in the TL's absence, (iii) liaise with line agencies involved, (iv) assist in improving the planning and design standards for subprojects, and (v) assist DOI in establishing and operating monitoring and support programs for operation and maintenance (O&M) activities.

4. **Participatory Development Specialists** (international and domestic). The specialists will (i) improve the operational guidelines for participatory renovation of farmer-managed irrigation

systems (FMIS); (ii) support operation of effective participatory procedures and arrangements in the project management system; (iii) assist in selecting appropriate NGOs to support participatory subproject preparation and implementation; and (iv) develop training programs, provide training for trainers, and supervise training activities.

5. **Water Resources Design Engineer** (international). The engineer will assist DOI in (i) upgrading design standards by reviewing innovative irrigation technology applicable nationally or internationally and identifying simpler or lower-cost structures; (ii) assist in improving procurement, construction supervision, and quality control guidelines for irrigation and associated infrastructure; and (iii) prepare training programs for relevant project personnel.

6. **Minor Irrigation Specialist** (domestic). The specialist will (i) collect and analyze available experience in innovative minor/micro irrigation interventions in Nepal; (ii) assist in developing appropriate appraisal procedures, planning process, design criteria and standards, and implementation procedure for minor/micro irrigation subcomponent of the Project; and (iii) assist in implementing the subcomponent by engaging NGOs.

7. **Agriculture Development Planners** (international and domestic). The consultants will assist in preparing district irrigated agriculture development strategies and SIPs, particularly feasibility analysis and agriculture development programs in the SIP. The international consultant will focus on the development of methodologies (to be reflected in the project operational guidelines) and assistance in initial preparation process through on-the-job training to the concerned staff (with preparation of training manuals), while the domestic consultant will focus on operation and quality control.

8. **Gender and Poverty Specialist** (domestic). The specialist will help implement the social development strategy and gender action plan (Appendixes 14–15). The specialist will (i) identify and analyze poverty and gender-related issues; (ii) implement a strategy and action plan for due participation of women; (iii) assist in designing and implementing gender-sensitive livelihood enhancement programs under SIP (while improving the project operational guidelines for livelihood enhancement); (iv) design and help implement the training programs for male and female water user groups to improve their gender equity and participation; and (v) design and help implement the training programs for the concerned project institutions.

9. **Environmental Specialist** (domestic). The specialist will (i) help establish and operate quality control mechanisms in preparing initial environmental examinations and implementing environmental monitoring and management plans, (ii) oversee environmental data collection for subprojects, and (iii) prepare and help implement appropriate training programs through the Environment Branch in DOI.

10. **Financial Management and Accounting Specialist** (domestic). The consultant will (i) develop operational guidelines on financial matters, including the project financial bookkeeping and accounting system at central, regional, and field levels; (ii) monitor project financial management; and (iii) assist in preparing and implementing training programs related to financial management for project staff, NGOs, private sector, and water user associations (WUAs).

B. Regional Project Support Unit (RPSU)

11. **Irrigation Planning and Design Engineers** (domestic, 2 positions). The engineers will help operate quality control systems of subproject planning and design activities, by monitoring,

advising on, and signing off on such outputs as reconnaissance survey reports, prioritized list of subprojects, feasibility study reports, SIPs, detailed design, and cost estimates.

12. **Construction Quality Control Engineers** (domestic, 2 positions). The consultants will help operate quality control systems of subproject construction activities. Specifically the consultants will (i) monitor tendering and construction activities to ensure effective contractor operation and supervision by the field engineers and WUAs; (ii) sign off on the final contractors bills after inspecting completed structures; and (iii) help prepare and implement training programs for project personnel and WUA representatives for sound construction quality control.

13. **Agriculture and Extension Specialists** (domestic, 2 positions). The consultants will (i) liaise with regional and district staff of the Department of Agriculture and Nepal Agriculture Research Center; (ii) help assist design and implement agriculture development programs in SIPs including on-farm water management, integrated pest management, etc.; (iii) develop and institutionalize agricultural input and benefit monitoring and reporting mechanisms; and (iv) help implement training programs for project agriculture staff, NGOs, private extension agents, and WUA farmer representatives.

14. **Agriculture Economists** (domestic, 2 positions). The consultants will (i) assist in preparing realistic financial and economic analyses in the subproject feasibility studies, (ii) develop agriculture input and benefit monitoring and reporting mechanisms together with the agriculture and extension specialists, and (iii) assist in implementing training programs for project staff and the private firms to be engaged for the feasibility studies.

15. **Livelihood Enhancement Specialists** (domestic, 2 positions). The consultants will (i) liaise with regional and district staff of the concerned line departments; (ii) assist in designing and implementing effective livelihood enhancement programs in SIPs; (iii) develop and institutionalize social status and benefit monitoring systems; and (iv) assist in implementing training programs for project staff, NGOs, private agents, and WUA farmer representatives.

16. **Resettlement Specialists** (domestic, 2 positions). The specialists will assist DOI to establish and operate a system to prepare resettlement plans (RPs) for the proposed subprojects during the preparatory stage. The consultant will (i) prepare and implement training programs for the project staff, private firms (engaged for RP preparation), and NGOs (engaged for RP implementation); and (ii) assist in the initial operation of the procedures and arrangements through field-level monitoring and supervision.

SUMMARY ECONOMIC AND FINANCIAL ANALYSES

A. Objective

1. The economic and financial analyses assessed the three core subprojects of the Project in terms of (i) affordability and sustainability, and (ii) economic feasibility. For each subproject, the capacity of individual farm households to bear the additional on-farm costs associated with the Project was assessed. The beneficial impacts of rehabilitated irrigation schemes, and all non-engineering support including agricultural extension on crop profitability are weighed against the capital costs and operation and maintenance (O&M) costs. The results can be both representative and indicative of the remaining sites. Given the sector approach in which subprojects with possibly wide variations will be selected during the implementation period, financial and economic assessment for the overall Project is not presented.

B. Approach and Major Assumptions

2. To determine the expected direct benefits of the subprojects, quantifiable effects are valued by comparing the with- and without-Project scenarios. The input-output coefficient of farm production, including cropping patterns, crop yields, fertilizer usage, and labor costs was estimated based on farm-level surveys in the concerned subproject areas, and cross-checked with the data reported in completed farmer-managed irrigation system (FMIS) projects in Nepal.¹ All subprojects analyzed were assumed to have an economic life of 20 years and to achieve the full benefits in the third year after civil work completion. The investment and O&M costs were estimated based on the field survey and design data. The overhead costs including consulting services, training, and administration were incorporated into the economic analysis. The analysis uses a world price numeraire, and economic prices for traded inputs and commodities (rice, wheat, maize, and fertilizers) were based on the World Bank Commodity Price Projections. The prices of other crops and farm inputs were derived based on the market prices in the subproject areas in July 2003. Labor costs were shadow-priced at 0.80.

C. Estimated Benefits

3. **Increased Crop Production and Associated Benefits.** As a result of improved FMIS, crop production is expected to increase, because of (i) reduced risk of production losses, (ii) expansion of command area, (iii) increase in yields, and (iv) changes in cropping intensities. The fragility of diversion structures made of earth, stones, or logs is a major factor constraining the productivity of FMIS during the monsoon, as the structure may not be easily rebuilt after it is washed away by floods and before the subsequent dry spell. An improved canal network will increase conveyance capacity and distribution efficiency, thereby allowing the expansion of the command area. Crop yields are expected to increase because of (i) more reliable water supply, (ii) increased use of modern inputs (induced by stable water supply), and (iii) provision of extension and other support services. The Project will also increase cropping intensities in areas where only one or two crops are planted per year because of lack of water in the dry season. With more reliable water supply, the farmers will intensify production of staple food crops while expanding cash crops in response to existing local market opportunities. In the three subprojects (representing some 1.8% of the estimated project area), production of total food grains, potato, and other cash crops is expected to grow from 1,530 tons (t), 530 t, 170 t, respectively, to 2,360

¹ While the Project aims to achieve the high potential yield levels for the concerned crops (as reported by the Nepal Agriculture Research Council), realistic estimates were adopted in terms of the assumed changes in input use, yields, and cropping intensities that are comparable to those observed in other FMIS projects (having little agriculture extension and other support services provided) for the purpose of the analyses.

t, 1,260 t, and 520 t. Increased crop production will lead to increased labor opportunities (by 46,000 person-days in the three subprojects) and improved food security of the population (paras. 12–14).

4. **Reduced Routine Maintenance Costs.** The Project will reduce the annual routine maintenance costs of irrigation facilities substantially, since the existing temporary structures will be replaced by semi-permanent or permanent structures. The need for repairing collapsed systems commonly required during the monsoon season for many FMIS will be reduced.²

5. **Nonquantified Benefits.** In addition, there are nonquantified benefits, including (i) improved FMIS planning system through district irrigated agriculture development strategies and individual subproject implementation plans (SIPs); and (ii) improved irrigation and related service delivery mechanism with transparent and accountable governance through empowered water user associations (WUAs) and local governance institutions (LGIs), and regular application of external technical auditing. Benefits derived from strengthening policy, planning, and institutional framework will also have wider impacts at national and field levels.

D. Assessment of Financial Returns

6. Farm budget analysis was conducted for typical farm households in the three subproject areas, differentiating currently irrigated and non-irrigated areas, and small, medium-size, and large farm households.³ The gains in farm net income as a result of the Project are compared with the farmers' share of investment costs (Table A13). The annual gains with the Project exceed the one-time investment costs for all categories of farm households. The net gain with the Project (NRs10,750–20,740 or about \$139–269 per family per year) represents a 70–85% increase in annual income on the average.⁴ The expected increase is higher for currently rain-fed areas, and reduces the income difference between the rain-fed and irrigated areas.

7. **Harinmari Subproject, Mahottari District, Central Development Region (Terai).** The rehabilitation of the irrigation system will expand the irrigation area from 185 ha to 255 ha. The area is fully cultivated for paddy in the monsoon, whereas cropping is limited to some 40% and 20% of the area in winter and spring, respectively, due to water unavailability and high distribution loss. In winter, the cropping pattern is relatively diversified, with 40% of the cultivated area used for cash crops produced such as oilseeds, lentil, potato, and vegetables, whereas the spring crop is mostly dominated by paddy and maize, with a small fraction of land (2.5%) cultivated for vegetables. The area has a large market surplus of food grains sold at the nearby district markets easily accessed through a dust road and a national road, whereas most of other crops are consumed locally within the area while small amounts of potato and other cash crops are also marketed out individually by farmers.⁵ The Project will generate several benefits. First, water supply in the monsoon season will become more reliable as a result of the rehabilitation, leading to rice yield increases, particularly in the currently rain-fed area. Second, the improved

² In addition to the labor requirements for routine O&M activities (that are reduced from the without-project level), the with-project analysis included the maintenance costs corresponding to 5% of investment costs annually, to meet the possible future rehabilitation requirements of semi-permanent or permanent structures.

³ Small, medium-size, and large farmers are defined as those having landholdings of up to 0.5 ha in the hills and 1 ha in the terai, up to 1 ha in the hills and 3 ha in the terai, and over 1 ha in the hills and 3 ha in the terai, respectively.

⁴ As a matter of comparison, a separate project, ADB. 2000. *Technical Assistance to the Kingdom of Nepal for Agriculture Sector Performance Review*. Manila (TA 3536, approved on 13 November 2000) reported that reliable irrigation when combined with improved seeds produces a net margin over 190% higher than nonirrigated rice in Nepal.

⁵ In general, cereals, pulses, and potato are purchased at farm gate by merchants acting as middlemen for mills and other processors, whereas vegetables are generally delivered to the district markets by farm families.

system will increase water delivery in the dry season on additional 30% and 15% of the command area in winter and spring, respectively, thereby increasing the overall cropping intensity from 160% to 206%, a level observed in many FMIS in previous projects. The expanded area is assumed to have a similar cropping pattern that prevails at present. The yield levels are also expected to increase with increased use of farm inputs promoted through agriculture extension and multiplication of food grain seed under the Project.⁶ As a result, the area will have a large market surplus of potato and small surplus of vegetables.

8. The subproject has 382 households, of which 33% are landless, 52% have a landholding of up to 1.0 ha, 11% with up to 3.0 ha, and the remaining 4% with 3 ha or more. Six household models were built to represent the major subgroup of beneficiaries categorized by landholding size and by current access to irrigation. As shown in Table A13, all farmers will benefit from this subproject, with an average annual income increase of NRs10,740 from increased crop production and on-farm and hired employment opportunities. All farmers can afford the required investment and O&M contributions that remain substantially lower than the incremental income.⁷

9. Talkharka Subproject, Ilam District, Eastern Development Region (Hills). Rehabilitating the irrigation system will expand the irrigation area from 110 ha to 210 ha. Due to the relatively high altitude, maize and millet are major crops in the monsoon season, accounting for 73% of the total area, followed by cardamom and potato. Dry season cropping (excluding perennial cardamom) is limited to 25% of the area in winter and 4% in spring due to the limited canal conveyance capacity and high distribution loss. Wheat accounts for 60% of winter cropping and the rest are cash crops including oilseeds, potato, and vegetables. Maize is the dominant crop in spring. Due to its location in the hills with regional food deficit, the farm gate prices of key inputs and outputs are higher by 10–25% compared with those in the terai. The subproject area produces a market surplus of food grains and potato sold locally. Some products such as cardamom are sold at district markets through a 4 km footpath and its connecting national highway. The subproject will make the water supply in the monsoon reliable, inducing farmers to adopt more intensive agriculture. Farmer surveys indicated the profitability of irrigated potato and cardamom, whose area is assumed to increase by up to 5% of the net cultivated area during the monsoon. The subproject will also expand the irrigated area on an additional 33% of the command area in winter and 7% in spring. Overall cropping intensity will increase from 131% to 170%. The assumed cropping pattern for the dry season is similar to the current situation. The yield levels are expected to increase with increased use of farm inputs.⁸

10. The subproject has 244 households, of which 9% are landless, 35% with a landholding up to 0.5 ha, 19% up to 1 ha, and the remaining 37% with 1 ha or more. All farmers will benefit from this subproject, with an average income increase of NRs20,740 annually (Table A13). All farmers will be able to pay for their share of the investment and O&M costs.

E. Assessment of Economic Returns

11. Results of the economic analysis show that the economic internal rates of return for the Harinmari, Talkharka, and Inglakhola schemes are 23%, 24%, and 25%, respectively, and the net present value (NPV) at a discount rate of 12% ranges from NRs7.6 million to NRs11.0 million. Switching values were estimated to determine the maximum levels of cost overrun, delay

⁶ The expected yields for paddy, wheat, and maize are 2.6–3.2 t/ha, 2.3 t/ha, and 2.3 t/ha, respectively, whereas those for other crops will increase by some 20% under irrigated conditions.

⁷ Affordability demonstrates the appropriateness of farmers' stated willingness to pay their share of the investment and O&M costs, which is included in the subproject selection criteria (Appendix 8).

⁸ The expected yield levels for wheat and maize are 2.3 t/ha, while those for other crops are assumed to increase by up to 30% under irrigated conditions.

in years to achieve the benefit targets, reduced incremental benefits, reduced incremental yield, and reduced food grain prices, at which the schemes will still be economically viable. Sample schemes remain economically viable with cost overruns of 77–94%, delay of 8.9–10.3 years in achieving benefit targets, 43–48% reduction in incremental benefits, and food grain price reduction of 35–86%. While the economic viability of each subproject appears robust, analysis indicated relatively high sensitivity to changes in price of key farm outputs. Thus, subproject feasibility studies should carefully assess key output prices and their projections, using field-based assessment of marketing chains and margins, and the available marketing opportunities.

F. Poverty Impact Assessment

12. According to the socioeconomic survey, the poor in the Harinmari, Talkharka, and Inglakhola subprojects account for some 55–62% of the subproject population, with the national ethnic minority population accounting for a substantial majority of beneficiaries crosscutting all farm size categories. The output of the benefit distribution analysis including the poverty impact ratio (PIR) for the three subprojects is shown in Table A13, based on the calculation for (i) increased crop production; (ii) increased on-farm family and hired labor opportunities; and (iii) increased construction labor opportunities, from which the NPV for farmer contribution was subtracted. The PIR using the national poverty line of NRs6,100 corresponds to 39–51%.⁹

13. The subproject will also improve food security, particularly for small farmers. On average, small farmers will increase food self-sufficiency from 90–165% to 150–240% in currently irrigated areas, and from 45–80% to 130%–145% in currently rain fed areas in the three subproject areas. Once food security is addressed, farmers have indicated their desire to grow more profitable crops such as potato, vegetables, and cardamom where market conditions allow. Subproject implementation is expected to provide these small farmers with opportunities to enhance their productivity and diversify their crop mix.

14. Poor people will also benefit from increased opportunities for family and hired on-farm labor, and for sharecropping and tenancy farming. Annual on-farm labor opportunities are estimated to increase by of 46,000 days in the three subprojects, of which at least 15,500 days will be hired almost totally from local small farmers and landless people including dalit (occupational castes). Sharecropping and tenancy are prevalent in the currently irrigated area of the Harinmari subproject (and observed little in its currently rain fed areas and other subproject areas), totaling 79 ha engaging 68 households mostly from landless and marginal farm families. In general, sharecroppers pay for half the cost of inputs, provide all cultivation activities, and receive four seventh of the harvest, whereas tenant farmers annually pay a fixed amount of grain. The arrangements are beneficial to sharecroppers and tenants, and the subproject is expected to provide further benefits to these people,¹⁰ while further expanding the sharecropped and tenant farming areas in the overall command areas particularly in currently rain-fed areas with benefits to marginal farmers and landless people; these benefits, however, are not quantified in the analysis.¹¹

⁹ People having less than double the national poverty line income, which corresponds to approximately \$0.4 per day, capture 55–71% of overall economic benefits.

¹⁰ For example, sharecroppers are estimated to obtain a gross margin of NRs11,500/ha for cultivation of paddy, which is expected to increase by NRs3,000 after subproject implementation. There is no notion of sharecroppers being little more than bonded laborers controlled by their landlords.

¹¹ The experience of the completed FMIS projects indicate that large farmers tend to lease the land to marginal farmers due to the labor constraints of the former and the availability to the latter of higher amounts of manure to apply per unit of land.

Table A13: Summary of Economic and Financial Analysis

| Item | Harinmari (Terai) | Talkharka (Hills) | Inгла Khola (Hills) |
|--|------------------------------|------------------------------|--------------------------------|
| Command Area (ha) | 255 | 210 | 141 |
| Previously Irrigated | 185 | 110 | 131 |
| Previously Rain-fed | 70 | 100 | 10 |
| Households | 382 | 243 | 265 |
| Landless | 127 (33%) | 23 (9%) | 4 (2%) |
| Small (Up to 0.5 ha in hills and 1 ha in terai) | 197 (52%) | 86 (35%) | 171 (65%) |
| Medium (Up to 1 ha in hills and 3 ha in terai) | 41 (11%) | 45 (19%) | 46 (17%) |
| Large (Above 1 ha in hills and 3 ha in terai) | 17 (4%) | 89 (37%) | 44 (16%) |
| Population | 2,100 | 1,327 | 1,696 |
| Incremental Net Crop Revenue (NRs) | 3,380,000 | 4,700,000 | 2,860,000 |
| Construction Cost (NRs) | 8,890,000 | 12,260,000 | 7,850,000 |
| Other Costs (NRs) | 6,850,000 | 5,640,000 | 3,790,000 |
| Economic Internal Rate of Return % | 22.7 | 24.0 | 24.7 |
| Economic Net Present Value (NRs) | 8,120,000 | 11,045,000 | 7,560,000 |
| Switching Values | | | |
| Cost Overrun (%) | 77 | 90 | 94 |
| Benefit Delay (years) | 8.9 | 9.5 | 10.3 |
| Incremental Benefit Shortfall (%) | 43 | 45 | 48 |
| Food Grain Incremental Yield Reduction (%) | 51 | - | - |
| Food Grain Price Reduction (%) | 35 | 86 | 72 |
| Incremental Income per Household (NRs) | | | |
| Landless | 1,843 | 3,757 | 1,410 |
| Small (Previously Irrigated/ Previously Rain fed) | 10,044/10,587 | 8,804/11,828 | 7,296/9,138 |
| Medium (Previously Irrigated/ Previously Rain fed) | 14,663/29,312 | 21,480/23,179 | 11,004/14,954 |
| Large (Previously Irrigated/ Previously Rain fed) | 59,592/59,105 | 26,442/49,325 | 25,237/25,329 |
| Average | 10,736 | 20,745 | 11,070 |
| Average Incremental Income (NRs/ha) | 21,437 | 29,105 | 23,950 |
| Project Investment Cost Contribution (NRs/ha) | 2,549 | 5,016 | 4,600 |
| Annual O&M Cost (NRs/ha) | 1,743 | 2,919 | 2,784 |
| O&M as Percent of Incremental Income (average) | 8 | 10 | 12 |
| Total Incremental Annual Labor Inputs (days) | 20,023 | 15,025 | 11,268 |
| Total Incremental Hired Labor | 6,498 | 6,004 | 2,962 |
| Crop Production (tons) | | | |
| Total (Without Project/ With Project) | 967/1,670 | 680/1,341 | 587/1,119 |
| Food Grains (Without Project/ With project) | 813/1,249 | 361/568 | 360/547 |
| Potatoes (without Project/ With Project) | 83/ 240 | 277/ 630 | 174/ 390 |
| Other Vegetables (Without Project/ With Project) | 71/ 182 | 42/ 143 | 54/ 182 |
| Poverty Incidence | 55% | 54% | 62% |
| PIR for Poor (Less than NRs6,100/year/person) | 0.43 | 0.39 | 0.51 |
| PIR for Near-poor (Less than NRs12,200/year/person) | 0.55 | 0.60 | 0.71 |
| Share of Net Benefits (%) | | | |
| Landless and small farmers | 52% | 16% | 43% |
| Medium | 20% | 19% | 18% |
| Large | 28% | 64% | 39% |
| Percent Land Under Sharecropping | 27% | 2% | 4% |
| Number of Sharecropper Households | 43 | NA | NA |

O&M = operation and maintenance; PIR = poverty impact ratio

Source: Asian Development Bank estimates.

SUMMARY POVERTY ANALYSIS AND SOCIAL DEVELOPMENT STRATEGY

A. Linkages to the Country Poverty Analysis

| Sector identified as a National Priority in Country Poverty Analysis? | Yes | Sector identified as a National Priority in Country Poverty Partnership Agreement | Yes |
|--|-----|---|-----|
| <p>Contribution of the Subsector to Reduce Poverty in Nepal: Agriculture accounts for 39% of the gross domestic product (GDP) and provides employment for 80% of the active workforce. However, agriculture is largely subsistence-oriented with annual rainfall primarily concentrated in the monsoon. Irrigation is the major investment tool for the Government to augment agricultural productivity throughout the year. Nepal is 142 in poverty ranking out of 173 countries, and the human development index (HDI) at 0.47 is one of the lowest in the region. The gender development index follows the same pattern.</p> <p>The Project covers all the 35 districts in the Eastern and Central Development regions; 11 are terai districts, 18 hills, and 6 mountains. Although the Central and Eastern regions have the highest HDI estimated at 0.493 and 0.484, respectively, pockets of poverty exist both within and across districts. While Sarlahi (0.306) in eastern terai and Sindhuli (0.310) and Rasuwa (0.192) bear testimony to the disparity in development, Siraha (0.323) in eastern terai has one of the highest concentrations of disadvantaged occupational caste groups. Of a total population of 10.7 million in the two project regions, ethnic groups comprise 3.4 million (1.7 million in each region) and disadvantaged occupational castes, more commonly called <i>Dalit</i>, 1 million (0.4 million in the Eastern and 0.6 million in the Central region).</p> <p>The proposed Project takes into account the enormous diversity in cultural and environmental conditions and in human capabilities within Nepal, and promotes more inclusive economic growth by (i) establishing subproject selection criteria that will allow targeting to small and marginal men and women farmers, (ii) developing irrigated agriculture strategy in each district or river basin, (iii) promoting improved coordination between agriculture and irrigation departments to maximize the benefits of increased availability of irrigation water, and (iv) enhancing social development with a focus on increasing capacity to address issues of gender and social exclusion at all levels. The Project's implementation strategy calls for crosscutting approaches and supports the Government's Tenth Five-Year Plan. Most of the poor are engaged in agriculture and live in rural areas, with the poorest allocating 69% of their total expenditure to food, 16% more than people at the highest income levels. Hence, the sector remains a major focus of the Government's poverty reduction strategies.</p> <p>Project components focus on (i) participatory irrigated agriculture development for farmer-managed irrigation system (FMIS), and (ii) institutional strengthening and project management. They include rehabilitating 25,500 hectares (ha) of existing irrigation schemes and bringing an additional 8,500 ha of land under irrigation while simultaneously (i) improving men and women farmers' access to irrigated agricultural extension services, and (ii) expanding linkages to marketing opportunities and credit to improve yields. Partnership with locally based nongovernment organizations (NGOs) for mobilizing beneficiary water user associations (WUAs) is expected to provide the stimuli for increased participation of women and disadvantaged ethnic and caste groups, and fairer sharing of irrigation water between the head, middle, and tail end users, to foster greater system ownership and sustainability. Based on economic and financial analyses of the three core subprojects, the net gain accruing to a family is \$165 per year, representing a 72% increase in annual income on average. Increased yields estimated at 2,360 tons (t) (grain), 1,260 t (potato), and 520 t (other cash crops) is expected to enhance food security, nutritional intake, and employment opportunities for poor women and men. Improved governance of WUA is expected to secure greater transparency and more equitable distribution of irrigation water, leading to more inclusive development. Improved performance in the irrigation sector is expected to have a significant impact on the economy and be decisive in reducing rural poverty. About 43% of overall economic benefits are expected to accrue to beneficiaries living below the poverty line, and 60% to those living near the poverty line (less than \$0.4 per capita a day).</p> | | | |

B. Poverty Analysis Proposed Targeting Classification: Targeted Intervention

Small farm size and poverty are linked. The poverty rate among holdings below 0.5 ha is 54%. Those classified as "agricultural or production workers" have a 54% poverty rate. Women play a major role in irrigated agriculture and this role will assume more importance as increasing numbers of poor men leave their homes to seek employment elsewhere. Poverty is also high (52%) among larger households with 6–8 persons. Hill ethnic groups such as Limbu, Rai, Sherpa and Tamang common in the project area have a poverty incidence of 58%. The Tharu are a terai-based ethnic group with a poverty incidence of 48%. Poverty is highest (68%) among the disadvantaged occupational castes (blacksmith, tailor, cobbler, and sweeper). They are either landless or own small plots of land around the homestead and depend on wage labor in urban areas to augment family income. Household food shortages and unemployment remain major risks for the majority of the people.

The Project has a strong poverty focus reflected through project processes that (i) give priority to subprojects with significant numbers of poor, as it targets areas that have populations with high percentages of ethnic groups; (ii) specifically engage the poor and disadvantaged ethnic and caste groups in targeted training programs and support; (iii) require high levels of participation and consultation of groups hitherto traditionally excluded; (iv) undertake interventions in marginal farming areas that have high incidences of poverty; and (v) mandate at least 33% women's participation in all project activities to secure more equitable distribution of benefits between the genders. Specific pro-poor interventions include improved irrigation infrastructure that will enable poor men and women farmers to have greater access to water during winter and spring when higher value

crops such as vegetables can be grown. Such access will increase food security, rural incomes, and labor opportunities. Demonstration pilot projects promoting nonconventional methods of irrigation such as drip and sprinkler will provide improved access to water on a micro scale to poorer women and men living in marginal lands, who because of limited access to available land or water, or both, are unable to benefit from the more traditional FMIS. They will have the opportunity to grow high-value crops and to improve their nutritional intake.

Social mobilization support and training include agriculture extension programs specifically targeted to poor men and women. Mechanisms for WUA organization building focus on strengthening WUA capacity to formulate necessary arrangements for continued system operation. In particular it gives attention to increase WUA capacity to manage irrigation water that is fair for all social groups while combining the interrelated physical (water and infrastructure), organizational (WUA rules, representation, and institutional structure and division of tasks) and agro-productive elements (soil, technology, input, and irrigated agriculture extension).

C. Participation Process

Is there a stakeholder analysis? Yes No

Is there a participation strategy? Yes No

The project promotes participatory approaches by mobilizing communities through the organization of 210 WUAs representative of their communities' social and cultural diversity and of which at least 33% will be women. WUAs and groups will come together formally, through registration of the organization to run FMIS in a systematic and corporate fashion. Nearly all interactions between men and women farmers and the Project are envisaged to take place through the WUA, including construction, design, extension, and training. The Project ensures that WUA capacity is sufficiently strengthened and provides for outsourcing WUA capacity-building activities to support organizations (locally based NGOs, national NGOs, and the private sector). To develop the human resources of the project area, locally-based NGOs will be trained to undertake beneficiary mobilization activities to ensure the envisaged social and gender outputs are secured. Strategies for achieving this will be culture-specific, with the Project taking immediate advantage of the more egalitarian and participatory attitudes of the hill ethnic groups to involve women in all project activities, yet placing slow and continuous pressure on those groups less willing to change. The village development committee (VDC) is envisaged to be actively involved in the process and the community organizers will support men and women farmers during the project period, and continue as an independent FMIS resource after Project completion. The Project will support the establishment of an FMIS stakeholder group, which will include representatives of the ministries and departments of all concerned line agencies, external funding agencies supporting irrigation and agriculture extension, National Federation of Irrigation Water Users Associations Nepal (NFIWUAN), and private sector organizations involved in FMIS improvement.

The Project provides for participatory development specialists and a gender and poverty specialist to facilitate participatory processes at all levels. Key strategies include capability training to ensure participatory skills are developed and used through applied learning techniques; promotion of farmer-to-farmer learning; support to decentralization in planning, implementation, and follow-up of training and construction activities; and special consideration to gender mainstreaming and environmental mitigation in all activities.

D. Gender Development

Strategy to maximize impacts on women:

The Irrigation Policy (2003) requires at least 33% women's representation in all registered WUAs and provides an opportunity to increase women's exposure and access to irrigated agricultural technology. However, there are significant regional and cultural differences in attitudes towards women's participation in decision-making in the irrigation sector. This goal will be more easily attained in some districts than in others. Therefore, additional effort will be required in districts where the 33% participation goal has remained elusive, and higher goals can be set in others where higher participation rates are already the norm. The Project will assist the Executing Agency to mainstream gender concerns in the sector by (i) strengthening the capacity of the Department of Irrigation (DOI) through the provision of a local gender consultant for the 7-year project period; (ii) recruiting a gender specialist from NGOs/firms who will work closely with the women development officers of the Ministry of Women, Children and Social Welfare (MOWCSW) and the district development committee (DDC) gender focal point to support gender mainstreaming activities at the district level; (iii) requesting 210 FMIS to have at least 33% women's representation in the registered WUA; (iv) including gender sessions in all training activities in addition to specific gender sensitization training to all stakeholders including DOI, Department of Agriculture, DDC senior and midlevel government officials involved in extension and field-level interaction, all WUA members, and NGOs/firms, among others; (v) including information about gender roles in irrigation in baseline survey of each district; (vi) undertaking three workshops—two regional and one national—on gender policy development and dialogue in conjunction with the MOWCSW, Ministry of Agriculture and Cooperatives (MOAC), National Planning Commission, and National Women's Commission; (vii) targeting at least 35% women farmers for all irrigated agricultural extension in line with MOAC's policy on women's representation; (viii) developing special programs for women in agriculture and water management with other members of the team and included in the district gender action plan to give pragmatic guidance at the local level; (ix) ensuring at least 35% women or female centered households will have access to nonconventional irrigation schemes; (x) ensuring at least two decision-making positions on the WUA management committee go to women in areas where there has already been progress in increasing women's participation; (xi) requiring all data to be

gender disaggregated; (xii) engaging partner NGOs/firms having at least 50% women field staff; and (xiii) ensuring larger outreach and benefits accrue to women farmers by recruiting at least 50% female community organizers in view of the fact that virtually all association organizers are male.

HAS AN OUTPUT BEEN PREPARED? Yes No

A gender plan has been prepared and is covenanted (Appendix 15)

E. Social Safeguards and Other Social Risks

| Item | Significant/ Not Significant/ None | Strategy to Address Issues | Plan Required |
|---|---|---|---|
| Resettlement | Not significant | Based on a survey of three core subprojects, only minimal strip acquisition is envisaged for widening or extending existing canals. A resettlement framework (RF) was prepared to deal with the limited impacts of the subprojects. Construction activities will not start until the resettlement plan (RP, containing an inventory of loss, the number of affected men and women and agreed upon compensation, whether voluntary/involuntary) is signed by the affected persons (APs) and implemented. Preparation of the RP is part of subproject preparation, and its implementation will be carried out in close consultation with and participation of APs and designated WUA men and women members, along with an acceptable third party witness. | <input type="checkbox"/> Full <input checked="" type="checkbox"/> Short <input type="checkbox"/> None |
| Affordability | None | Participating men and women farmers' share in labor and cash contribution is based on the principle of equity in contribution and benefit sharing, hence impediments to project implementation is not foreseen. The Project will take steps to ensure that the cost of credit and inputs is reasonable and that poor men and women farmers have equal access to credit through appropriate arrangements for collateral. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Labor | Not-significant | While the Project will increase the labor requirements to 3.3 million person-days annually, of which 58% are additional female employment opportunities, no major impact on the labor market is foreseen. Rather, the Project will increase earning opportunities for women and men, and reduce the need for male migration and thus have positive impacts on women and improved family well-being. The Project will monitor child labor and compliance with the international core labor standards. The Project will ensure equal pay between men and women for the same work. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Indigenous Peoples | Not-significant | The Project targets areas with high percentages of ethnic groups. In the three core subprojects, ethnic peoples issues were found insignificant as the beneficiary group comprises an ethnic local majority but a national minority. Where small disadvantaged ethnic and caste groups may be identified, ADB's <i>Policy on Indigenous Peoples</i> will be applied and will build on the organizational model of each ethnic group's FMIS. A sample indigenous peoples specific actions (IPSA) has been prepared as a precautionary measure, which will be integrated in subproject implementation plans (SIPs). Safeguards to ensure inclusiveness include subproject selection criteria that will require the WUA management committee to constitute roughly the same proportions of its social and gender profile as the population of the WUA. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Other Risks/ Vulnerabilities | None | Potential risks include the ongoing insurgency, extortion of funds from Government and NGO staff by the insurgents, political instability, lack of capacity of locally based NGOs, delays in the devolution process, and inadequate interdepartmental coordination. The Project has several built-in safeguards: participatory planning to ensure the full participation of all stakeholders; WUA centrality in subproject selection, system design, construction oversight; and increased emphasis on training in management and irrigation extension at community level. Any potential risk will be addressed, as there is strong Government commitment and ownership of the Project. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |

GENDER ACTION PLAN

The Irrigation Policy (2003) requires at least 33% women's representation in all registered water user associations (WUAs) to provide an opportunity to increase women's exposure and access to irrigated agricultural technology and extension. However, there are significant regional and cultural differences in attitude towards women's participation in decision making in the irrigation sector. Therefore, strategies will be culture-specific, with the Project taking immediate advantage of the more egalitarian and participatory attitudes of the hill ethnic groups to involve women in all project activities, while placing slow and continuous pressure on the more conservative groups.

The Gender action plan includes the following:

- (i) **Provision of gender specialists.** A local gender and poverty specialist will be employed to support all gender-related activities during the Project period. Gender specialists will also be required from nongovernment organizations (NGOs) or firms to help support women's participation in each district. The NGO/firm gender specialists will work in conjunction with the women's development officers and district development committee (DDC) gender focal points. The consultant gender specialist will develop a project gender operational strategy endorsed by the Department of Irrigation (DOI) to guide project staff and stakeholders in maintaining a participatory process in the irrigation sector.
- (ii) **Women's representation in WUAs.** Part of the social mobilization process will include bringing women's participation rate up to at least 33% as required by DOI for all registered WUAs. Since a WUA must be registered to participate in the Project, the 33% rate should become the norm. This in itself will be insufficient to ensure a meaningful role for women, so the Project will also have a target of women not only being members of the WUAs, but having roles in the leadership as well. Therefore, the gender specialist will provide gender sensitization training to WUA members, and leadership training to women to facilitate their increased and more active participation in WUA activities.
- (iii) **Gender training.** The gender specialist will organize capacity development training in gender issues for all project staff, including those from support organizations such as NGOs/firms. Sessions on gender and development will be part of the main project orientation training. The DDC of each project district will select one person to work with the NGO/firm gender specialist to play a catalytic role in gender promotional efforts in the district.
- (iv) **Increasing the number of women in contact with extension services.** Representation of women staff in DOI and the Department of Agriculture is low. Woman-to-woman contact has been found to be more effective in reaching poor women. Therefore, at least 50% of community organizers will be women who will complement the work of the association organizers of DOI.
- (v) **Integration of gender data.** The baseline survey of each district will include information on gender roles in irrigation and agriculture activities. The gender specialist, with the support of the NGO/firm gender specialist in each district, will ensure this data is included in subproject planning, implementation, and monitoring and evaluation.
- (vi) **Gender policy development and dialogue.** Gender policy development will be pursued and addressed by the Project through three workshops—two regional and one national. The gender specialist will facilitate this and collect opinions for formulating gender policy within DOI. The workshops will be facilitated in collaboration with other national stakeholders, particularly the National Planning Commission (NPC), Ministry of Women, Children, and Social Welfare (MOWCSW), and Ministry of Agriculture and Cooperatives (MOAC). The policy statement will contain the means of ensuring that action is taken.
- (vii) **Field channel groups.** Each field channel group will have at least 35% women farmers following the MOAC policy on women's representation and participation. From each group two leaders, a man and a woman, will be selected and trained to serve as local extensionists.
- (viii) **Creating opportunities for female-centered households.** At least 35% women or female-centered households will be provided an opportunity in the nonconventional irrigation subcomponent such as drip and sprinkler, and water harvesting to increase production on small plots of land with very small investment. Since an increasing number of poor women are now managing farms due to the migration of male family members for wage labor, the Project will focus part of its effort on bringing these technologies to women. Furthermore, microcredit facilities will be made available to women through NGOs having access to the microfinance facilities of the Rural Microfinance Development Center.
- (ix) **Monitoring and Evaluation.** The gender specialist will contribute the establishment of a project monitoring system, to be adopted by DOI to incorporate data disaggregated by gender, ethnicity, and caste. The specialist will also provide inputs on other aspects of project management information system (MIS) ensuring its gender responsiveness. Within the project cycle, biannual reviews will be undertaken to cover all aspects of Project implementation including achievement of gender goals. Under the guidance of gender specialist, the NGO/firm gender specialist will develop a gender action plan reflecting local attitudes and practices for each district. The plan will be an integral part of the subproject preparation process. The plan will contain training proposals as well as strategies for increased participation of women as farmer trainers, WUA members, participants in project-related activities such as extension programs, walk-through, and participatory evaluations. Special programs for women in agriculture and water management will be jointly developed with project staff. Gender development will be an integral part of the Project's overall targets and strategies.

SUMMARY RESETTLEMENT FRAMEWORK

1. **Scope and Impacts.** The resettlement framework outlines the policy and procedures for preparing of the subprojects under the Community-Managed Irrigated Agriculture Sector Project. The Project will renovate the existing farmer-owned and farmer-managed irrigation systems (FMIS) through improved diversion and canal systems. The process involves widening or extending the existing canals, for which land needs to be acquired by water user associations (WUAs). However, land acquisition is limited to a minimum strip. The project preparatory technical assistance (PPTA) indicated that in the three sample subprojects, 0.77 hectare (ha) of land is needed to expand the command area from 426 ha to 569 ha, which represents 2.5% of the farm plot area through which the canals pass. Some land parcels may also be required for temporary use, such as quarry sites and place for storing construction material.

2. **Resettlement Policy.** Resettlement will be implemented in accordance with the policy on involuntary resettlement of the Asian Development Bank (ADB) and the Government's Irrigation Policy of 2003.

3. **Resettlement Principles and Entitlements.** The resettlement framework applies to all resettlement effects arising from land acquisition or conversion, or any other effects that arise from the project works, including the effects on people with no title to the land. Those affected will be entitled to maintain at least their standard of living at pre-project level, and to receive compensation for all types of losses, including land, crops, trees, structures, and any other assets at full replacement value. Due to the economic benefits and increased value of land property arising from the improved irrigation systems, those affected may also voluntarily contribute the land, as an option, with written agreements between the WUA and the affected persons witnessed by a third party. Significantly affected persons, who lose 10% or more of their total land or income, if any, and vulnerable groups such as female heads of households, poor people below the poverty line, occupational castes, and ethnic minorities will be eligible for further assistance such as counseling on compensation fund management and priority access to project employment opportunities. Affected people, including those with no land titles, will receive priority assistance under the Project's agriculture and social development subcomponent. Table A16 summarizes the types of loss and entitlements of the affected persons.

Table A16: Compensation Entitlement Matrix

| Type of Loss | Entitled Unit | Entitlement/Compensation |
|--|---|--|
| 1. Loss of land and assets for the irrigation canals | Landowner and tenant | a. The legal owners will get compensation at replacement cost determined through agreement between AP and the WUA. b. If there are tenants, compensation will be divided between tenants and owners. |
| 2. Voluntary contribution of land by owner to WUA | Landowner | Internal agreement between the landowner and the WUA with 'no coercion' clause witnessed by a neutral party, i.e., NGO or VDC chairperson acceptable to the Project and the participating parties. |
| 3. Loss of standing crops and trees on the land acquired for the canal | Crop owners and others | a. Legal owners will get compensation at replacement cost/value as determined through agreement between AP and the WUA. b. If there is a tenant, he/she will get 50% of the compensation and the other 50% will go to the absentee landowner. |
| 4. Loss of community or common property | Structure owners or users | If such structures are identified during feasibility studies, the resettlement plan will include measures to avoid, mitigate, or compensate impacts. If identified only during construction, compensation should be provided at replacement cost as determined by the Grievances Resolution Committee. |
| 5. Loss of land and income-generating assets by non-titled persons | Property users/owners identified during baseline survey | Those persons with no title to the land who have been using/owning the affected property will get compensation/assistance at replacement cost determined through agreement between the AP and the WUA. |

| Type of Loss | Entitled Unit | Entitlement/Compensation |
|--|---------------------------|---|
| 6. Temporary impact or damages during construction | Property owner and others | The EA or the contractor will be required to pay to the APs or communities compensation as determined by the Grievances Resolution Committee. |

AP = affected persons, EA = executing agency, NGO = nongovernment organization, VDC = village development committee, WUA = water user association.

Source: Asian Development Bank.

4. **Institutional Responsibilities and Procedures.** The Central Project Management Office (CPMO), with a designated resettlement officer, will guide, monitor, and report on land acquisition. The Regional Project Support Unit (RPSU), with a designated resettlement and social development officer, will supervise the resettlement plan preparation and implementation carried out by the Subproject Management Unit (SMU). A resettlement specialist will be hired for each RPSU under the consultancy for institutional development and project management (ISPM) to assist in supervising the resettlement activities. Nongovernment organizations (NGOs) will be engaged to help SMU and WUAs plan and implement the resettlement plan. At each subproject level, social assessment will be done during the feasibility study to determine the category of the likely resettlement impacts, based on which a full or short resettlement plan will be prepared by the NGO with necessary land survey and social impact assessment undertaken by private firms during the detailed design stage. The complete resettlement plan will be prepared before Government approval of the detailed design, and should include signed agreements with the affected persons including a no-coercion clause witnessed by a third party in case of voluntary contribution; and a bank deposit slip to verify that the WUA has deposited sufficient up-front cash required for land compensation. The plan will be submitted to ADB for approval, and affected people should be fully compensated before civil work contracts are awarded.

5. **Disclosure, Consultation, and Grievances.** Each resettlement plan will be prepared and implemented in close consultation with the stakeholders and will involve focus group discussions and meetings particularly with the affected persons. Before submitting them to ADB, copies of the draft resettlement plans will be disclosed to the public in project information centers to be set up at central, regional, and subproject level offices, and released to any requester including project-affected persons and NGOs. ADB will also post the resettlement framework and resettlement plans in its resettlement web site as appropriate. A grievances resolution committee (GRC) will be established in each subproject, under the chairmanship of the village development committee (VDC) chairperson. Other members are two representatives (one man and one woman) of affected persons, WUA chairperson, NGO representative, and representative from the Project. The affected persons may submit their concerns or grievances verbally or in writing to the GRC. The GRC will facilitate the concerned parties agree on a time-bound action plan to resolve the grievances that are found to be genuine.

6. **Monitoring and Evaluation.** The CPMO will establish a monthly monitoring system involving RPSU and SMU. RPSU will prepare progress reports on all aspects of resettlement and social development efforts and outcomes with the assistance of ISPM resettlement specialists, based on which the CPMO will prepare a quarterly progress report on resettlement. External monitoring will be assigned to an independent agency preferably NGO, which will undertake annual monitoring and report to the CPMO and ADB.

7. **Resettlement Cost.** The cost of land compensation will be borne by the WUA. Cost for the staff and NGOs assigned to prepare, implement, and monitor resettlement plans, and conduct skills training for income generation will be borne by the Government and ADB.

SUMMARY OF SHORT RESETTLEMENT PLANS FOR CORE SUBPROJECTS

1. **Scope and Impacts.** The improvement of farmer-managed irrigation system (FMIS) in the three core subprojects entails the following impacts from the widening of the existing canals and addition of new branch canals to irrigate an expanded command area (Table A17).

Table A17. Resettlement Impacts of Core Subprojects

| Item | Harinmari (Terai) | Talkhalka (Hills) | Inglakhola (Hills) |
|------------------------------------|----------------------------|----------------------------|----------------------------|
| Command Area | 255 ha (185 ha at present) | 210 ha (110 ha at present) | 141 ha (131 ha at present) |
| Land Required (LR) | 1.24 ha | 0.59 ha | 0.17 ha |
| Affected Households (AH) | 145 | 40 | 43 |
| LR/ as %of total landholding of AH | 0.69 | 0.41 | 0.60 |

ha = hectare.

Source: Asian Development Bank.

2. The proposed alignment passes through largely agricultural land. Due to strip acquisition, there is no significantly affected person losing more than 10% of his/her income or is physically displaced. All farmlands are cultivated by farmers by themselves, so there are no tenants or non-titled people. Thus, there is no significant resettlement impact in these subprojects.

3. **Stakeholder Consultation and Entitlements.** During the project preparatory stage, the Government with the assistance of the consultants undertook initial consultations in the three subproject areas, and presented resettlement framework (RF, Appendix 16) translated into the local language. The feedback and observations made at the stakeholders' meetings were used in preparing the entitlement matrix and discussing the project benefits for affected people.

4. The consultations revealed that, while households were concerned that they would lose a certain level of income due to the acquisition of the strip of land, they opined that the loss would be far outweighed by the benefits from increased reliability and availability of irrigation water that would enhance crop productivity and intensity.¹ Consequently, all households were found ready to voluntarily contribute their land. It was also confirmed that the female heads of vulnerable households would be given priority access to subproject agriculture and livelihood enhancement programs and employment opportunities.² Further consultation and finalization of the entitlement matrix and resettlement plan will continue prior to the approval of the subproject's detailed design, including the written agreements between the landowner and the WUA, with a "no coercion" clause and witnessed by a neutral party in case of voluntary land contribution.

5. **Implementation Responsibilities and Cost Estimates.** The arrangement as described in the RF (Appendix 16) is followed, including the implementation arrangements (engagement of local NGOs with supervision and support with the assistance of the consultants); disclosure, consultation, and grievance mechanisms; and monitoring and evaluation. If any affected households choose the compensation option, the necessary fund will be provided by the WUA.³ The cost of preparing and implementing the resettlement plan, to be undertaken by private firms and NGOs under the supervision of the RPSU and SMU, will be borne by the Government and ADB. Compensation, if any, will be provided to the concerned affected households before civil works contracts are awarded.

¹ The affected households will, on the average, lose NRs200–400 of income annually in each subproject from the land provided to canals, while they will gain over NRs15,000–70,000 through improved irrigation access.

² There are five, two, and three households with female heads among the affected households in Harinmari, Talkharka, and Inglakhola subprojects, respectively, who will lose 1.47%, 0.25%, and 1.02% of the total landholdings.

³ The Government will deduct the same amount from the WUA's capital contribution requirement for subproject implementation (corresponding to 3% of diversion and 10% of other structure costs).

SUMMARY INITIAL ENVIRONMENTAL EXAMINATION

A. Introduction

1. In accordance with Asian Development Bank (ADB) guidelines, initial environmental examination (IEE) was carried out as part of the project preparatory technical assistance (PPTA) for the Community-Managed Irrigated Agriculture Sector Project. The IEE assessed the environmental implications of the sector loan interventions, identified mitigating measures, and developed environmental review and assessment procedures. In view of the different ecological locations, IEEs for three sample subprojects were prepared during the PPTA: Harinmari subproject located in the alluvial terai, and Talkharka and Inglakhola subprojects in the hills. The proposed Project is categorized as environmental category B under *Environmental Consideration in ADB Operations* (2003). Project interventions were screened with reference to ADB's *Environmental Assessment Guidelines* (2003).

2. The project area covers 35 districts in Eastern and Central Development regions and show considerable diversity of geography comprising mountains (12% of the area, with altitude above 4,800 meters [m]), hills (65%), and the terai (23%, with altitude below 500 m) that lies across the southern belt. The Project aims to improve agricultural productivity of the existing farmer-managed irrigation systems (FMIS) while strengthening service delivery mechanisms and community institutions. The Project will include about 210 subprojects with an average area of 250 hectares (ha) in the terai and 100 ha in the hills. The major physical interventions will be construction of permanent diversion structures, and improvement of canals and ancillary structures.

B. Environment Conditions for the Sector Project

3. Nepal has a rich but fragile environment and faces a number of physical and human challenges. Its rugged terrain, young geology, and monsoon climate produce high rates of runoff, erosion, and sedimentation with frequent floods and landslides. High population growth combined with high poverty incidence is also causing soil erosion, deforestation, biodiversity loss, and air and water pollution. The rivers in the project area are categorized into (i) large perennial rivers originating in the Himalayas, (ii) medium rivers from the midland that are perennial but have wide seasonal fluctuations, and (iii) a large number of small seasonal rivers in the terai. While there is no water shortage in large rivers, there are possibilities of water deficits in some subbasins of the medium rivers during March–May. Small rivers from southern hills do not have much water beyond the postmonsoon period. Water availability thus constrains water use in irrigation systems. Many systems in the southern terai belt along small rivers have limited scope for year-round run-of-the-river irrigation. Overall, about 40% of the irrigation systems have year-round irrigation capacity.

4. The project strategy of rehabilitating the existing FMIS to improve the reliability of diversion and efficiency in water use with institutional development will mean that potential environmental impacts will generally be positive. Potential environmental concerns include water use conflicts and quality deterioration in areas of water scarcity, particularly in dry season. FMIS in the hills may destabilize land and possibly encourage further conversion of forest to agricultural lands. Water and soil quality may also be affected as a result of enhanced agricultural activities in the concerned FMIS. Given that subproject works are generally on a small scale, scattered in wide areas, and confined to existing agricultural lands, they can be kept minimal with little cumulative impacts, through due environmental considerations in subproject screening, planning, and implementation.

C. Summary of IEEs prepared for Subprojects

1. Description of the Subprojects and the Environment

5. Key features of the three core subprojects are summarized in the table.

Table A18.1: Summary of Scope of Principal Works for the Three Core Subprojects

| Item | Harinmari | Talkharka | Inglakhola |
|--|--|---|--|
| Location | Mahottari districts, in the terai | Ilam district, in the hills | |
| Size of command area | Current: 185 hectares (ha) After project: 255 ha | Current: 110 ha After project: 210 ha | Current: 131 ha After Project: 141 ha |
| Nature and scope of headworks improvements | Strengthening of existing diversion bund, escape structure, gabion mattress and twin discharge weir | Construction of 11 meter (m) concrete weir, gallery and gravel trap and control device | Construction of 24 m gabion weir, gravel trap, and control device |
| Nature and scope of canal network improvements | Strengthening of 3,807 m main canal, 5,340 m branch canals and 1,460 m tertiary canals. Provision of bed bars to retain canal profile. Diversion boxes and some drop structures. | Strengthening of 1,200 m main canal, 1,100 m branch canal and 1,500 m extension branch canal. Offtake structures and drop structures. | Strengthening of 4,260 m main canal, 1,480 m of branch canals and 1,020 m extension canal. Offtake structures and drop structures. |
| Additional provisions | Concrete crossings and culverts for track crossings | Concrete crossings and culverts for track crossings, gabion and masonry retaining structures, and slope protection works | |

Source: Asian Development Bank.

6. **Harinmari.** The scheme is located in the terai. The water source is a small local stream, the Geruka Khola, with perennial flow fed by spring water. To divert water, farmers build embankments that have to be rebuilt after floods. The area was originally covered by dense forest but has been cleared for human settlement. There is no protected area or significant remnant of forest. Trees have been planted around homes, forming scattered vegetation clumps providing some habitat for wildlife. There are 382 households with an average size of 5.8 persons. Over 55% are poor. The area is rural, with an urban portion 5–15 kilometers (km) away, connected through dust road and a national road. Services such as electricity are absent.

7. **Talkharka and Inglakhola.** Both schemes are located in hilly terrain. Water resources are substantial, with river flow sustained during dry season. Irrigation is operated through temporary diversion made of bush, logs, and stones that require regular rebuilding. Much of the cultivated land is terraced, surrounded by forested steep slopes and ridges. A large number of multipurpose trees grown around the houses and including fodder and fruit trees afford habitats to wildlife. No protected areas occur within. The total number of households is 243 and 265, and poverty incidence is 54% and 62% in Talkharka and Inglakhola, respectively. Services such as electricity and roads are limited. Access to health and education is similarly poor.

2. Screening of Potential Environmental Impacts

8. The Project comprises two parts: part A, participatory irrigated agriculture development for FMIS, and part B, institutional strengthening and project management. The environmental impacts are confined to part A. Part B develops the capacities of the project institutions to plan, implement, operate, and maintain the FMIS, including training on environmental issues to ensure the full operation of the Project's environmental assessments and review procedures. The impacts and mitigating measures in each subcomponent of part A are summarized below.

9. **Participatory Planning and Beneficiary Mobilization.** This subcomponent is environmentally harmless as it involves participatory planning and social mobilization of farmers.

10. **Irrigation and Associated Infrastructure.** Irrigation facilities and ancillary structures such as flood protection works will be financed. The IEEs identified environmental impacts that could arise from (i) location, in terms of downstream water use and ecosystems affected by increased intake by improved FMIS, and possible encroachment of protected areas; (ii) design, in terms of land acquisition and resettlement, erosion of slopes along canals caused by structures, and drainage congestion; (iii) implementation, in terms of possible destabilization of steep slopes, temporary pollution such as noise, dust, and silt runoff due to excavation; and (iv) operation, in terms of waterborne diseases due to standing water, and underachievement of benefits due to poor operation and maintenance (O&M).

11. In the IEEs, no sample schemes showed relevant location-related impacts.¹ For future schemes such impacts will be avoided at subproject screening stage by undertaking stringent water resources assessment and consultation with downstream users and excluding schemes having negative impacts. All core subprojects have resettlement impacts, which are mitigated by preparing and implementing resettlement plans (Appendix 17). In the two hill schemes, possibilities for increased erosion of slopes along canals, will be mitigated with environment-friendly slope protection measures and soil investigation during detailed design stage. For all core subprojects, contractors will be required to avoid construction-related pollution. Likewise, waterborne diseases and poor O&M would be an issue for all core subprojects. They will be mitigated by raising awareness and ensuring proper and sustainable O&M with sufficient WUA strengthening and training.

12. **Agriculture Development and Livelihood Enhancement.** The activities include agriculture extension to promote crop intensification and diversification, targeted support including income generation for the poor and the disadvantaged, and pilot micro irrigation for the poor. While these activities will enhance the livelihood of the poor, they may cause soil and water contamination due to increased agrochemical use and livestock activities resulting from irrigation-induced increased fodder availability, reduced soil nutrient, biodiversity loss, introduction of alien species, and conversion of forests and wetlands into farmland. These were found relevant in all core subprojects, and will be mitigated by including sustainable land use practices in agriculture extension, such as promoting organic-based practices, optimal use of fertilizers, and integrated pest management; monitoring the production of traditional varieties; and carefully selecting sites to avoid the conversion of ecosystems hosting unique species.

13. **Support for Sustainable O&M.** Completed FMIS schemes will be monitored while rehabilitating the schemes that have suffered from severe natural calamities. Civil works may cause similar environmental impacts, which will be mitigated following the same arrangements.

3. Public Consultation

14. Stakeholder consultations were held at subproject, district, and national levels to discuss anticipated environmental impacts and their mitigating measures.² In general, the stakeholders anticipated positive environmental impacts, while endorsing the project approach of inclusive, participatory, and demand-driven FMIS renovation. Their views were reflected in the IEEs and other project documents.

¹ In urban areas near Harinmari, industrial pollution is an issue, but the implication of the scheme is deemed minimal, given the large catchment area at the point of industrial effluent. The factory is also introducing treatment facilities.

² Subproject-level meetings were held in June–August 2003 with farmer groups (more than 400 people in total) for the subproject and adjacent areas. District-level meetings were held during the period with groups of local governance institutions, line agency, and nongovernment organization (NGO) staff. Two national workshops to discuss the project design including IEEs were held in February and September 2003 with some 100 representatives from line agencies, donors aid agencies, NGOs, and private organizations.

D. Environmental Review and Management Procedures and Arrangements

15. Based on the IEEs and stakeholder consultation and following the ADB guidelines and the Government's environmental requirements,³ project-specific environmental assessment procedures and arrangements (EAPA) were prepared (Supplementary Appendix K), and their costs were included in the Project. Procedures and institutional responsibilities are summarized in Table A18.2. For an average subproject, about \$3,000 is provided for environmental (excluding resettlement) management to cover the cost of consultation (10%), IEE and planning activities (55%), mitigation management (30%), and equipment (5%).

Table A18.2. Environmental Management Procedures and Institutional Responsibilities

| Subproject Stage | Responsible Organization | Responsibilities |
|------------------------|----------------------------------|---|
| Overall | ISPM consultants | Support development of the capacity for environmental planning, monitoring, and management |
| | DOI environment and M&E branches | Guidance for environmental planning, monitoring, and mitigation (environment branch) and management of M&E data (M&E branch) |
| | CPMO | Overall review, monitoring, and reporting including progress reports |
| Screening ^a | RPSU/SMU | Screen the project requests in light of environmental criteria. |
| Planning | RPSU/SMU—firms | Prepare IEE (included in SIP), minimize avoidable losses, incorporate mitigating measures, and prepare monitoring plan, with stakeholder consultation |
| | CPMO | Coordinate for IEE endorsement by environmental branch of DOI |
| | PAC | Approve IEE and SIP |
| WUA formation | RPSU/SMU—NGOs/ COs | Strengthen WUA including capacities for monitoring. |
| Detailed design | RPSU/SMU—firms | Assist in preparing RP, incorporate EMP into engineering designs |
| | RPSU/SMU—NGOs | Prepare and implement RP |
| Construction | Contractor | Implement required environmental measures |
| | RPSU/SMU—firms | Supervise contractor implementation of environmental measures |
| Agriculture support | RPSU/SMU—firms/NGOs | Implement specific environmental monitoring and mitigation measures incorporated in the agriculture and livelihood enhancement programs |
| Operation | RPSU/SMU—NGOs | Carry out annual performance audit of completed schemes. Support additional mitigation measures as necessary |
| | WUAs | Monitor agriculture practice and impacts and report them to SMU |

CO = community organizer, CPMO = central project management office, DOI = Department of Irrigation, EMP = environmental management plan, IEE = initial environmental examination, ISPM = institutional strengthening and project management, M&E = monitoring and evaluation, NGO = nongovernment organization, PAC = project appraisal committee, RP = resettlement plan, RPSU = regional project support unit, SIP = subproject implementation plan, SMU = Subproject Management Unit, WUA = water user association.

^a Upon submission of the subproject request by WUAs, the SMU will carry out environmental screening. Key criteria include (i) reliable water availability and no significant impact on other users or on the ecosystems; (ii) stability of structure location against landslide and riverbank erosion; (iii) suitable soil condition; (iv) no direct threat to ecologically sensitive historically important areas; and (v) subproject size less than 1,000 ha in the terai, 500 ha in the hills, and 200 ha in steep hill sites.

Source: Asian Development Bank

E. Conclusion and Recommendations

16. The principal findings of the IEEs are that the Project provides for environment-friendly irrigation interventions and contributes to significantly improved living conditions. The identified adverse effects will be addressed through proper site location, planning, design, implementation, and O&M while incorporating identified mitigating measures. The Project can therefore be classified under Category B. Further subprojects will follow the project-specific EAPA developed in conformity with ADB's environmental and social safeguard policies. Appropriate review and monitoring throughout the project life will be carried out to ensure that the guidelines are adhered to and that adequate capacity development support is given to the project institutions carrying out the assessments and to the concerned communities.

³ These are stipulated in Environmental Protection Act 1996 and its 1997 Rules revised in 1999.